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**DRAFT FINAL PARCEL B SITE INSPECTION REPORT, PUBLIC SUMMARY,  
VOLUME 1 OF 2**

04/18/1994  
HARDING LAWSON ASSOCIATES

Approved for public release: distribution unlimited.

**Public Summary  
Draft Final  
Parcel E Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California**

Prepared for

**Department of the Navy**  
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**PUBLIC SUMMARY  
DRAFT FINAL PARCEL B SITE INSPECTION REPORT  
HUNTERS POINT ANNEX  
SAN FRANCISCO, CALIFORNIA**

This document describes the recently completed site inspection (SI) of a 66-acre area known as Parcel B, at Hunters Point Annex (HPA), San Francisco (Figure 1). HPA is a former U.S. Navy shipyard that in 1989 was listed as a federal Superfund site. Site inspections are the second stage of the Superfund process to characterize and clean up contamination at the facility. The Superfund process is outlined in Figure 2. Terms identified in Figure 2 are explained in the glossary.

Various federal laws, regulations, and agreements are driving the environmental cleanup process at HPA. These are listed below:

- The Comprehensive Environmental Response, Compensation and Liability Act of 1980, also known as "Superfund", as amended in 1986; HPA was added to the list of Superfund sites in 1989
- The National Contingency Plan (NCP) - the regulation that implements Superfund
- Installation Restoration Program - the Navy's cleanup program under which contaminated sites at the facility were identified for cleanup. Twenty Installation Restoration (IR) sites have already been incorporated into the Superfund process as remedial investigation/feasibility study (RI/FS) sites because they were known to be contaminated; 5 of these sites are in Parcel B (Plate 1)
- The Base Closure and Realignment Act (BRAC) of 1990; the Defense Department put HPA on its Base Closure List in 1990, mandating that the facility be cleaned up and made available for nondefense use
- The Federal Facilities Agreement, signed in January 1992 by the Navy, the U.S. Environmental Protection Agency (EPA), and California regulatory agencies; the FFA governs the cleanup process at HPA.

In 1992, HPA was divided into five parcels to expedite site cleanup and land reuse. The parcels may ultimately be transferred to the City and County of San Francisco. As spelled out in the Memorandum of Understanding signed by the Navy and the City on January 21, 1994, the City has the right of first refusal to acquire parcels when certified clean. Before the parcel-by-parcel transfers occur, various investigations and remedial actions will be conducted at each parcel.

This site inspection investigates sites in Parcel B identified in a preliminary assessment (PA) as needing further investigation. The PA, which is the first stage of the Superfund process, was conducted at the facility in 1989 and 1990 to identify areas where chemicals may have been released

to the environment. The PA was based on a records search, interviews, and site visits. Utilities and building sites where possible releases to the environment were identified based on the record search, interviews, and site visits, and were designated PA sites, and SI work plans to investigate them were prepared by the Navy.

The site inspection at the PA sites in Parcel B was conducted in 1993. Each of the 11 PA sites in Parcel B, which consist of utilities, buildings, and a drydock, was inspected. The Parcel B portions of the basewide utilities, which include steam lines, sanitary sewers, storm drains, and fuel distribution lines, were inspected. Locations of possible former electrical transformers were also investigated. Even though Drydock 4 is located in Parcel C, the drydock and surrounding area was investigated as part of the Parcel B site investigation. (The Drydock 4 area is labeled as PA-57 on Figure 1.) The Navy requested the Drydock 4 area be investigated at the same time as Parcel B in order to characterize, clean up, and reutilize the Drydock 4 area more quickly.

The remaining PA sites investigated are shown on Figure 3 and include buildings and demolished building sites with previous uses including photograph development, a cafeteria, a machine shop, an acid mixing plant, carpentry, offices, maintenance facilities, storage, and metal fabrication. Some of these buildings are currently leased by tenants for vinegar making, photography, woodworking, and furniture finishing.

The site inspection field work included collecting 165 samples from 93 locations within the 66-acre area. The samples included:

- One hundred and ten soil samples from soil borings, trenches, and monitoring well borings
- Ten groundwater samples from monitoring wells and borings
- Twenty-four sediment samples from storm drains, catch basins, vaults, etc.
- Fifteen water samples from steam lines, storm drains, sewers, etc.
- Six samples of oil or sludge.

Most of the samples were analyzed for the types of chemicals that commonly occur at industrial sites:

- Volatile organic compounds, including solvents and chemicals found in gasoline
- Semivolatile organic compounds, including components of plastics, diesel fuel and other petroleum hydrocarbon products



- Pesticides, for example DDT
- Polychlorinated biphenyls, found in electrical equipment such as transformers
- Petroleum hydrocarbons, including gasoline, diesel, and motor oil
- Metals from activities such as machine shops and metal plating.

The results of the chemical analyses for the samples from each PA site were then evaluated to support decisions that either no further cleanup action is required or to conduct further investigations to better characterize the extent of contamination and progress to the RI phase.

The decisions were made by comparing soil and groundwater chemical data to three primary criteria: interim ambient levels (IALs), health-based levels (HBLs), and state and federal maximum contaminant levels (MCLs) for drinking water. Figure 4 shows the evaluation process.

- IALs are "background" concentrations of metals. Metals occur naturally in soil and water; these naturally occurring concentrations are background levels.
- HBLs are concentrations of chemicals that may result in adverse human health effects after prolonged exposure. HBLs are developed for different groups of people (for example, adult residents, child residents, workers) based on the potential for them to be exposed to the chemicals onsite.
- MCLs are drinking water standards.

Data were also evaluated to assess whether they indicated that a point source release had occurred. A point source release is one from an identifiable source (for example, a leaking underground storage tank); by comparison, a nonpoint source release is generally low-level contamination that cannot be attributed to a particular source. Additional work is usually required when a point source release is identified, in order to determine the extent of the release. Nonpoint source releases at HPA do not need to be characterized further, because they occur throughout the parcel rather than in discreet locations. A summary of the chemicals detected at each of the PA sites is presented in Table 1.

After evaluating the site inspection data for the PA sites in Parcel B,

- Additional work is proposed at portions of five of the PA building sites (PA-23, PA-24, PA-25, PA-26, and PA-42) and at Drydock 4 (PA-57)
- No further work is proposed for one of the PA building sites (PA-31), which includes one building

- Additional work is proposed to remove locally contaminated sediments from the storm drain system and evaluate the potential for the storm drain catch basins to leak into surrounding soil
- Additional work is proposed for the sanitary sewer to evaluate the source of contamination at one location (near IR-6)
- Additional work is proposed at one of the electrical transformer locations in PA-24 to evaluate the extent of PCBs in the underlying soil
- Additional work is proposed to drain the steam lines, evaluate the extent of oil in the underlying soil, and remove accessible crumbling asbestos-containing material
- Additional work is proposed to drain and remove the fuel distribution lines and to evaluate the extent of fuel oil in the underlying soil.

Once the proposed work is completed, the results will be combined with those from previous RI/FS, PA, and other site assessment investigations, and a parcel-wide RI/FS report will be prepared in anticipation of final remediation.

No further action is recommended for areas shown in dark blue on Figure 3; areas shown in red are or will become IR sites. Additional reports on the IR sites are available in the administrative record at local information repositories.

A draft version of this document (*Draft Parcel B Site Inspection Report* - January 11, 1994) was previously submitted to the public and the regulatory agencies. The comments received on this previous version have been incorporated into this document as appropriate; specific comments and the Navy's responses can be found in the appendices.

## **GLOSSARY**

**Administrative Record** - A compendium of all documents pertaining to the investigation and cleanup at HPA relied upon to select a remedial action.

**Chemical** - In the context of this document, elements or compounds present which, if left in place at current concentrations, could detrimentally affect human health or the environment, including groundwater. Such chemicals may include petroleum hydrocarbons and metals.

**Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund)** - A federal law that addresses the funding for and cleanup of abandoned or uncontrolled hazardous waste sites.

**Feasibility Study (FS)** - An evaluation of potential remedial technologies and treatment options that can be used to clean up a site.

**Groundwater (GW)** - Water present underground in the voids between soil particles.

**Groundwater Monitoring Wells** - Wells specially designed and designated for sampling groundwater. These wells are only used to assess the chemical quality of groundwater and not to produce drinking water.

**Metals** - Chemical elements such as iron, copper, and lead, that occur naturally at low levels in most soil and groundwater but are also found at higher levels in, for example, gasoline and diesel fuel and where metal equipment is used or disposed.

**National Contingency Plan (NCP)** - The primary regulation implementing CERCLA.

**PCBs** - Polychlorinated biphenyls, compounds containing benzene and chlorine. They were used in electrical transformers, but are no longer used because they are highly toxic.

**Pesticides** - Substances used to kill or control plant and animal pests. Some, like DDT, are especially toxic.

**Petroleum Hydrocarbons** - In the context of this document, chemical compounds produced from the refining of crude oil, such as those found in motor oil or gasoline.

**Preliminary Assessment (PA)** - Review of records and other existing information to determine if a release or potential release may require investigation.

**Record of Decision (ROD)** - A report documenting the final agency-approved remedial actions that will be required to clean up a particular Superfund site.

**Release** - Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment.

**Remedial Investigation (RI)** - Exploratory inspection conducted at a site to delineate the nature and extent of chemicals present.

**Semivolatile Organic Compounds** - Chemical compounds containing the element carbon, and that evaporate somewhat into air. Examples include components of plastics and diesel fuel.

**Site Characterization** - An investigation of the nature and extent of contamination associated with the known or potential release of hazardous substances.

**Site Inspection (SI)** - An onsite investigation to determine whether there is a release or potential release and the nature of the release. The purpose is to augment the data collected in the preliminary assessment and to generate, if necessary, sampling and other field data to determine if further action or investigation is appropriate.

**Superfund** - See Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) above.

**Volatile Organic Compounds** - Chemical compounds containing the element carbon, and that may evaporate easily into air, such as those found in gasoline.

**Table 1. Summary of Detected Chemicals  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

PA Site	Buildings/Areas	Soil	Groundwater
<b>UTILITY SITES</b>			
PA-45	Steam Lines Drydock 4	Asbestos, PCBs, RAD, SOCs TOG, TPH-D, TPH-G, VOCs	
PA-46	Fuel Distribution Lines	Metals, PAHs, PCBs, TPH-D TPH-E, TPH-P, TRPH, VOCs	
PA-50	Storm Drains	CN, Metals, PCBs, SOCs TPH-D, TPH-G, TRPH, VOCs	
PA-50	Sanitary Sewer Lines	CN, Metals, PCBs, SOCs TPH-D, TPH-G, TRPH, VOCs	
PA-51	Former Transformers (Building 128)	PCBs	
<b>BUILDING SITES</b>			
PA-23	Buildings 146 and 161	Metals, PAHs, PCBs, PEST, SOCs, TPH-D, TPH-E, VOCs TPH-MO, Waste oil	
PA-24	Buildings 128 and 130	Asbestos, Metals, PCBs, SOCs, TOG, TPH-D, TPH-E, TPH-G, TPH-P, VOCs	Asbestos, Metals, PAHs, TOG, TPH-D, TPH-E, TPH-P VOCs
PA-25	Building 134	Metals, PAHs, PCBs, SOCs, TOG, TPH-D, TPH-E, VOCs, TPH-MO, TPH-P	
PA-26	Buildings 157 and 141	Asbestos, Metals, PAHs, PCBs, TOG, TPH-E, TPH-G, TPH-P, VOCs	
PA-31	Former Building 114	Metals, PAHs, RAD	
PA-42	Building 109	Metals, PAHs, PCBs, PEST, TOG, TPH-E, TPH-MO	
PA-57	Hazardous Waste Accumulation Area	Asbestos, Metals, PCBs, SOCs, TOG, TPH-D, TPH-G, VOCs, Waste oil	

**Table 1. Summary of Detected Chemicals**  
**Parcel B Site Inspection Report**  
**Hunters Point Annex**  
**San Francisco, California**

PA Site	Buildings/Areas	Soil	Groundwater
<b>USTs</b>			
UST 2	S-135	Metals, SOCs, TPH-D, TPH-G	
UST 3	S-136	Metals, PCBs, SOCs, TPH-D, TPH-G, VOCs	

CN	= Cyanide.
PAHs	= Polycyclic aromatic hydrocarbons.
PCBs	= Polychlorinated biphenyls.
PEST	= Pesticides.
RAD	= Radiation.
SOCs	= Semivolatile organic compounds.
TOG	= Total oil and grease.
TPH-D	= Total petroleum hydrocarbons as diesel.
TPH-E	= Total petroleum hydrocarbons as extractable unknown hydrocarbons.
TPH-G	= Total petroleum hydrocarbons as gasoline.
TPH-MO	= Total petroleum hydrocarbons as motor oil.
TPH-P	= Total petroleum hydrocarbons as purgeable unknown hydrocarbons.
TRPH	= Total recoverable petroleum hydrocarbons.
VOCs	= Volatile organic compounds.

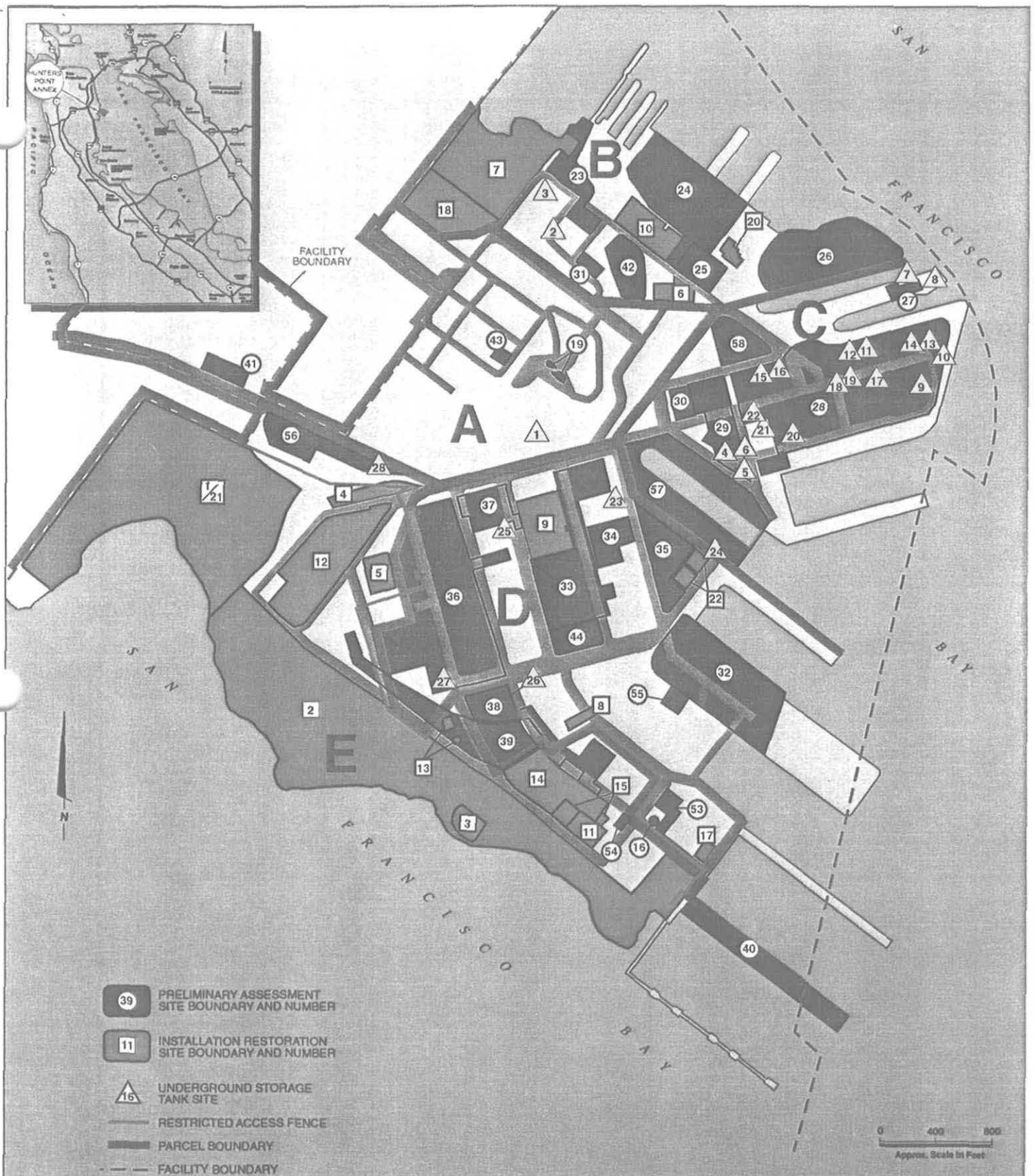
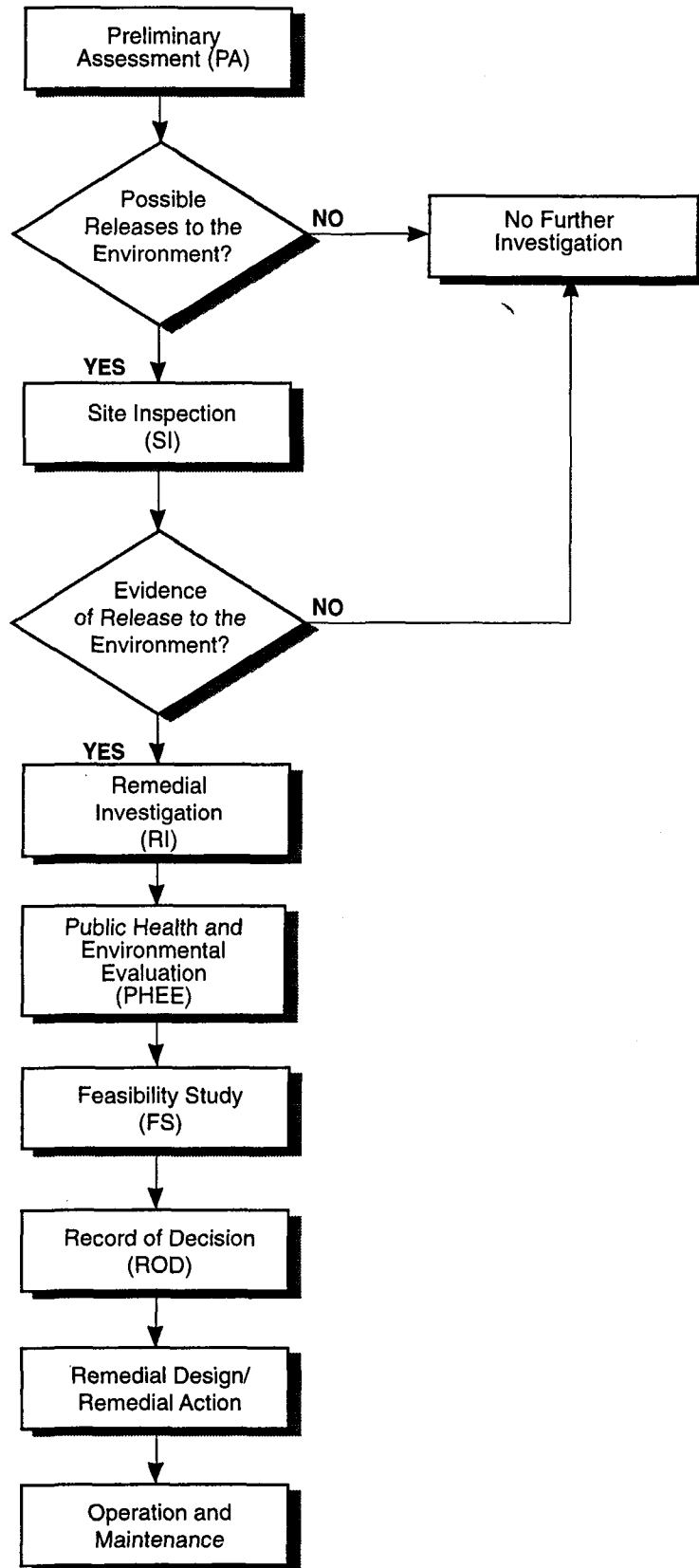


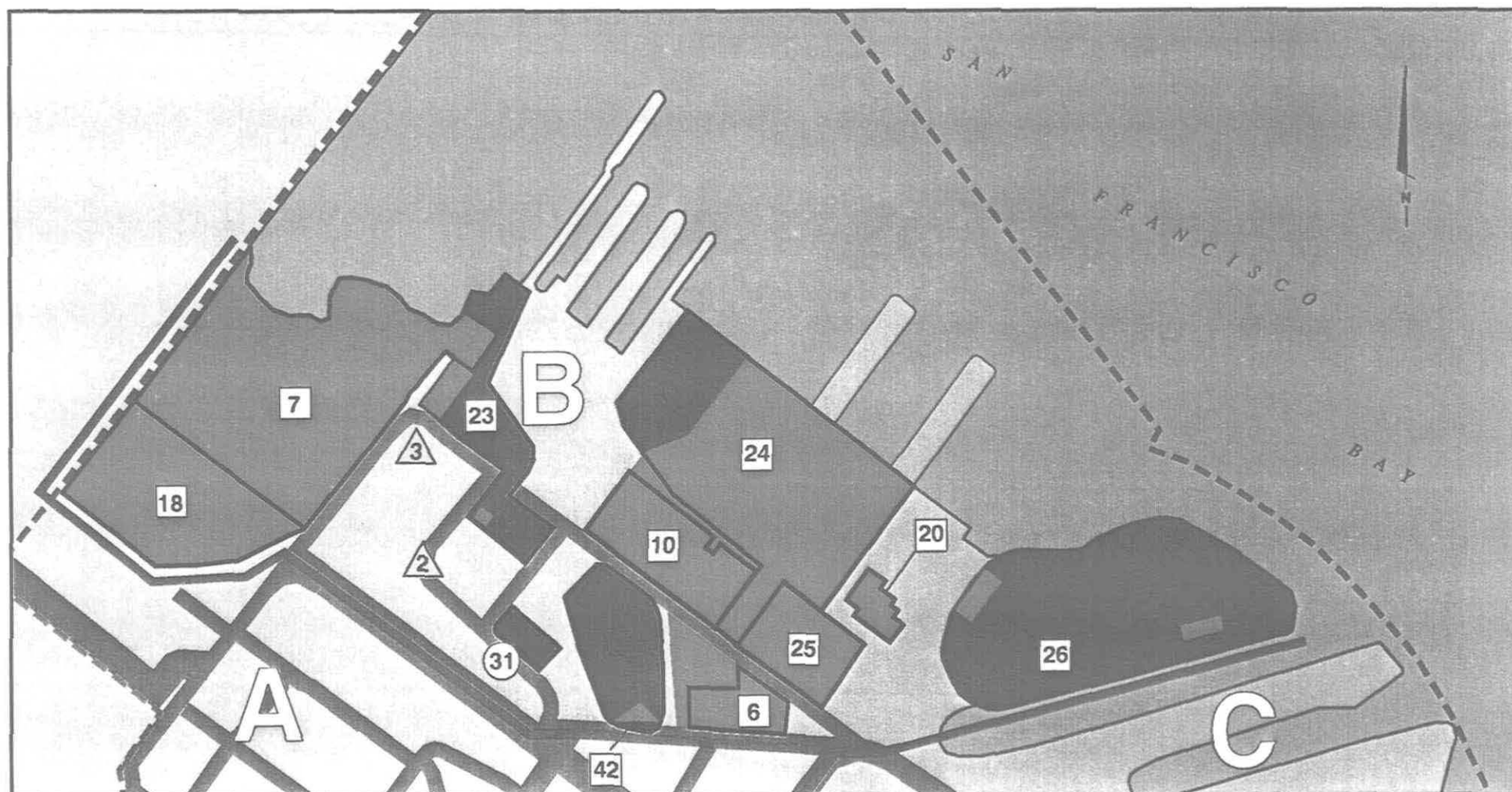
Figure 1. Hunters Point Annex Parcel Map



**FIGURE 2. SUPERFUND PROCESS**



PARCEL B: 66 acres



0 400 800  
Approximate Scale in Feet



INSTALLATION RESTORATION SITE



PRELIMINARY ASSESSMENT SITE  
WITH NO FURTHER ACTION  
RECOMMENDATION



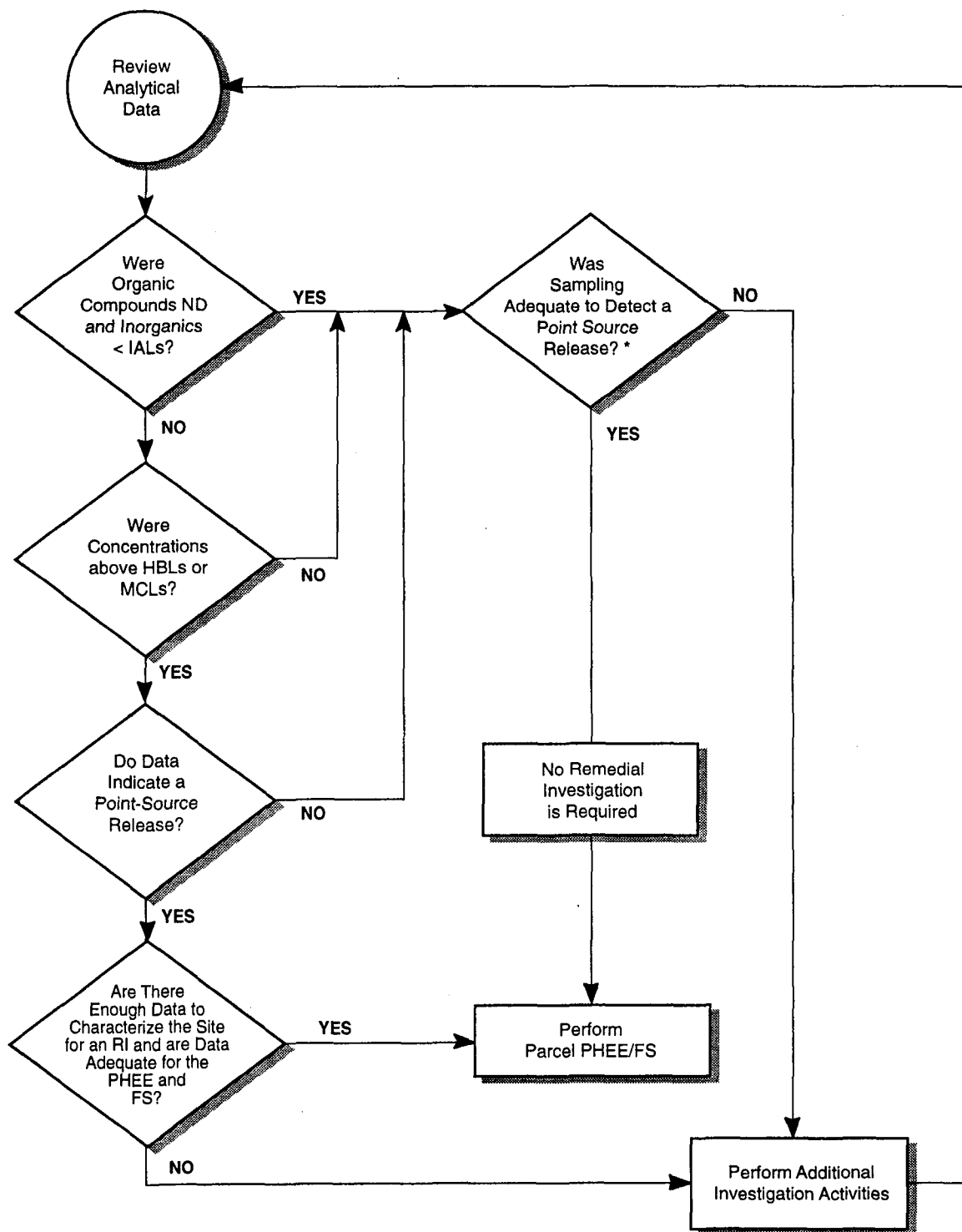
UNDERGROUND STORAGE TANK  
SITES RECOMMENDED FOR  
INCLUSION IN INSTALLATION  
RESTORATION PROGRAM

— PARCEL BOUNDARY

- - - FACILITY BOUNDARY

NOTE: Utilities (steam lines, fuel lines, storm  
drains and sanitary sewers) not shown

Figure 3. Parcel B Site Inspection Results



ND = Not detected

<IALs = Less than Interim Ambient Levels

\* = Based on (1) Site History and (2) Sample Locations

**FIGURE 4. DATA EVALUATION PROCESS**

**Draft Final  
Parcel B Site Inspection Report  
(Including Drydock 4 Area)  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California**

**Volume I: Text, Tables, and Plates**

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## **DISTRIBUTION**

## ACRONYMS

AAL	applied action level
ARAR	applicable or relevant and appropriate requirement
ASR	Alternative Selection Report
AST	aboveground storage tank
ASTM	American Society of Testing and Materials
ATSDR	Agency for Toxic Substances and Disease Registry
ATT	Aqua Terra Technologies
BAAQMD	Bay Area Air Quality Management District
BRAC	Base Closure and Realignment Act
bgs	below ground surface
BS/BSD	blank spike/blank spike duplicate
CCV	continuing calibration verification
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
COC	chemical of concern
CRDL	contract-required detection limit
CRQL	contract-required quantitation limit
DOH	San Francisco Department of Health
DTSC	Cal-EPA Department of Toxic Substances Control (formerly DHS)
DWR	Department of Water Resources
EAF	environmental attenuation factor
ECA	Ecological Risk Assessment
ECR	excess lifetime cancer risks
EM	electromagnetics
EMCON	EMCON Associates
EP	extraction procedure
EPA	U.S. Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ESAP	Environmental Sampling and Analysis Plan
EUH	extractable unknown hydrocarbon
FFA	Federal Facilities Agreement
FS	Feasibility Study
GC/MS	gas chromatography/mass spectrometry
GF	graphite furnace
GPC	gel-permeation chromatography
GPR	ground penetrating radar
HBL	health-based level
HBLc	health-based level for carcinogenic chemical
HBLn	health-based level for non-carcinogenic chemical
HEAST	Health Effects Assessment Summary Tables
HEPA	high efficiency particulate cartridge
HI	hazard index
HLA	Harding Lawson Associates
HPA	Hunters Point Annex
HQ	hazard quotient
IAL	interim ambient level
IAS	initial assessment study



ICP	inductively coupled plasma
ICS	interference check sample
ICV	initial calibration verification
IDL	instrument detection limit
IR	Installation Restoration
IRIS	Integrated Risk Information System
LCS	laboratory control sample
LUFT	leaking underground fuel tank
LUFT D	LUFT Manual test for TPH as diesel
LUFT G	LUFT Manual test for TPH as gasoline
MCL	maximum contaminant level
MDL	method detection limit
MSA	method of standard additions
MSL	mean sea level
MS/MSD	matrix spike/matrix spike duplicate
$\mu\text{g/kg}$	micrograms per kilogram
$\mu\text{g/l}$	micrograms per liter
$\mu\text{g/m}^3$	micrograms per cubic meter
$\text{mg/kg}$	milligrams per kilogram
$\text{mg/l}$	milligrams per liter
NAPL	nonaqueous phase liquids
Navy	Department of the Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ND	not detected
NPL	National Priorities List
NPV	net present value
NPWD	Navy Public Works Department
NRDL	National Radiation Defense Laboratory
NSTI	Naval Station Treasure Island
O&M	Operations and Maintenance
OU	Operable Unit
OVA	organic vapor analyzer
PA	Preliminary Assessment
PAH	polycyclic (or polynuclear) aromatic hydrocarbon
PARCC	precision, accuracy, representativeness, completeness, and comparability
PCB	polychlorinated biphenyl
%D	percent difference
PHEE	Public Health and Environmental Evaluation
POTW	Publicly Owned Treatment Works
PPE	personal protective equipment
PRC	PRC Environmental Management, Inc.
PVC	polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
QAPjP	Quality Assurance Project Plan
Q&RA	quality and reliability assurance
RA	risk assessment
RAF	Relative Absorption Factor
RAO	remedial action objectives
RCRA	Resource Conservation and Recovery Act of 1976
RF	response factors
RfD	reference dose
RI	Remedial Investigation
RME	reasonable maximum exposure

ROD	Record of Decision
ROICC	Resident Officer In Charge of Construction
RPD	relative percent difference
RRF	relative response factor
RRT	relative retention time
RSD	relative standard deviation
RWQCB	Regional Water Quality Control Board, San Francisco Bay Region
SAAQ	State Ambient Air Quality Standard
SACM	Superfund Accelerated Cleanup Model
SARA	Superfund Amendments and Reauthorization Act of 1986
SDG	sample-delivery group
SF	slope factor
SFDA	San Francisco District Attorney's Office
SFDWQ	San Francisco Department of Water Quality
SI	Site Inspection
SOC	semivolatile organic compound
SOW	statement of work
STLC	soluble threshold limit concentration
SUPSHIP	Navy Office of the Supervisor of Shipbuilding, Conversion and Repair
SVOA	semivolatile organic analysis
SWAQAT	Solid Waste Air Quality Assessment Test
SWRCB	State Water Resources Control Board
TCLP	Toxicity Characteristic Leaching Procedure
TDS	total dissolved solids
TIC	tentatively identified compounds
TIMP	Tidal Influence Monitoring Program
TOG	total oil and grease
TPH	total petroleum hydrocarbons
TPH-D	total petroleum hydrocarbons as diesel
TPH-G	total petroleum hydrocarbons as gas
TRG	target remedial goal
TRPH	total recoverable petroleum hydrocarbons
UCL	upper confidence limit
UST	underground storage tank
VOA	volatile organic analysis
VOC	volatile organic compound
WESTDIV	Western Division, Naval Facilities Engineering Command
WESTEC	WESTEC Services, Inc.
YEI	YEI Engineering, Inc.

## CHEMICAL ABBREVIATIONS

1,1-DCE	1,1-Dichloroethene
1,2-DCA	1,2-Dichloroethane
1,2-DCE	1,2-Dichloroethene (total)
2,4-Dmphenol	2,4-Dimethylphenol
4-Mphenol	4-Methylphenol
4M2pentanone	4-Methyl-2-pentanone
a-Chlordane	alpha-Chlordane
Ag	Silver
Al	Aluminum
As	Arsenic
b(2Eh)phthal	Bis(2-ethylhexyl)phthalate
Ba	Barium
Be	Beryllium
Benz(a)anthr	Benzo(a)anthracene
Benzo(a)pyre	Benzo(a)pyrene
Benzo(b)flranth	Benzo(b)fluoranthene
B(b)flranthn	Benzo(b)fluoranthene
Benzo(k)flranth	Benzo(k)fluoranthene
B(k)flranthn	Benzo(k)fluoranthene
Ca	Calcium
Carbon disul	Carbon disulfide
Carc PAHs	Total Carcinogenic PAHs
Cd	Cadmium
Co	Cobalt
Cr	Chromium
Cu	Copper
Dbz(ah)anthr	Dibenzo(a,h)anthracene
DDD	4,4'-DDD
DDE	4,4'-DDE
Fe	Iron
Fec Coliform	Fecal Coliform
g-Chlordane	gamma-Chlordane
Hg	Mercury
Indno pyrene	Indeno(1,2,3-cd)pyrene
K	Potassium
Mg	Magnesium
MIBK	Methyl isobutyl ketone
Mn	Manganese
Mo	Molybdenum
Na	Sodium
Ni	Nickel
Noncarc PAHs	Total Noncarcinogenic PAHs
Pb	Lead
PCE	Tetrachloroethene
Sb	Antimony
TCE	Trichloroethene
Tl	Thallium
TOG	Total Oil & Grease
TPH	Total Petroleum Hydrocarbons

TPH-E	TPH-Extractable Unknown Hydrocarbons
TPH-Extr unk	TPH-Extractable Unknown Hydrocarbons
TPH-MO	TPH-Motor Oil
TPH-Mtr Oil	TPH-Motor Oil
TPH-Purg unk	TPH-Purgeable Unknown Hydrocarbons
TPH-Ttl Recv	TPH-Total Recoverable Petroleum Hydrocarbons
Ttl Asbes	Total Asbestos
V	Vanadium
Zn	Zinc

## **1.0 INTRODUCTION**

This site inspection (SI) report was prepared by Harding Lawson Associates (HLA) with PRC Environmental Management, Inc. (PRC), on behalf of the Department of the Navy (Navy), Base Closure Team, Western Division, Naval Facilities Engineering Command, under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract N62474-88-D-5086, Contract Task Order No. 142. Activities described in this report are part of the SI tasks performed within Parcel B and at Drydock 4 at the Naval Station Treasure Island (NSTI), Hunters Point Annex (HPA), San Francisco (Plates 1 and 2). A description of Parcel B is provided in Section 2.0. The SI at Parcel B was performed in accordance with the *Draft Final Site Inspection Work Plan: PA (Preliminary Assessment) Other Areas/Utilities, Volumes I, II, and III (HLA 1992a, b, e)*. Volume I of the SI Work Plan covered underground utilities, Volume II addressed sites for which some analytical data were available when the work plan was prepared, and Volume III covered sites for which no analytical data were available when the work plan was prepared. These work plan volumes were modified with the issuance of several field variances, which are presented in Appendix A.

Four utility sites and six building sites in Parcel B were investigated. Because of potential reuse plans, the Drydock 4 Area site is also included in this report. The sites are:

### **Utility Sites**

- PA-45 (Steam lines)
- PA-46 (Fuel distribution lines, Tank Farm)
- PA-50 (Storm drains and sanitary sewers)
- PA-51 (Former transformer locations)

### **Building Sites**

- PA-23 (Buildings 146, 161, and 162)
- PA-24 (Buildings 124, 125, 128, and 130)
- PA-25 (Building 134)
- PA-26 (Building 157 and Area XIV)
- PA-31 (Building 114)

- PA-42 (Buildings 109 and 113)
- PA-57 (Drydock 4 Area)

This report describes the activities performed and results obtained at these 11 sites and is organized as follows. Section 2.0 presents background information including a description of HPA and its history, previous and concurrent investigations conducted in Parcel B, and the physical characteristics of Parcel B. Section 3.0 lists the field and analytical investigative methods used during the SI. Section 4.0 discusses the potential migration pathways and receptors. Section 5.0 discusses the SI objectives, field investigations, results, conclusions, and recommendations based on the activities performed for the portions of the four utilities that lie within Parcel B (PA-45, PA-46, PA-50, PA-51). Section 6.0 similarly discusses the objectives, field investigations, results, conclusions, and recommendations for the six building PA sites (PA-23, PA-24, PA-25, PA-26, PA-31, and PA-42), and the Drydock 4 Area (PA-57). Section 7.0 summarizes the proposed work for the utility and building sites. Section 8.0 summarizes the risk assessment for the parcel prepared by PRC. References are included in Section 9.0.

Additional information on the procedures and results of the SI are provided in the 12 appendixes to this report. Appendix A contains the field variances. Appendixes B and C present detailed descriptions of the geologic units and of the field and analytical methods, respectively. Test pit logs are in Appendix D, and boring logs and well completion details are in Appendix E. Analytical results are presented in Appendix F. Appendix G is the Quality Assurance/Quality Control Report and Appendix H is the risk assessment, both prepared by PRC Environmental Management (PRC). Appendix I contains the Health Based Level, Interim Ambient Level, and Maximum Contaminant Level reports of the data collected during the SI. Exploratory excavation procedures are presented in Appendix J. Agency comments and Navy responses to the Parcel B data presentation meetings are compiled in Appendix K; similarly, comments and responses to the Draft Parcel B Site Inspection report are compiled in Appendix L.

For completeness, this report also contains specific recommendations for further work at four existing IR sites in Parcel B. Background information, and tables and plates showing this proposed work are presented in Appendix M.

## **1.1 Purpose**

The purpose of the SI was to gather data to (1) evaluate whether contamination is present and if a release(s) to the environment has occurred, (2) assess site-specific hydrogeologic conditions, and (3) evaluate each site for possible inclusion in the Navy's Installation Restoration (IR) program. Additionally, at sites where there were existing analytical data indicating potential soil or groundwater contamination (i.e., PA-24), the focus of the SI included (1) evaluation of the groundwater flow direction and gradient, (2) identification of additional possible source(s) of contamination, (3) further identification of possible migration pathways and potential receptors for contaminants, and (4) further assessment of potential public health threats.

The project status, results, conclusions, and recommendations of the Parcel B SI activities were summarized for the regulatory agencies at meetings held July 27 and October 12, 1993. Agency comments on the results and recommendations presented at these meetings were dated August 11 and December 29, 1993, and were addressed by the Navy; the responses to these comments are presented in Appendix K. The *Draft Parcel B Site Inspection Report* was submitted to the agencies on January 11, 1994 (HLA, 1994). Agency comments on the draft report were dated February 23, 1994 and March 4, 1994; Navy responses to these comments are presented in Appendix L.

## **2.0 BACKGROUND**

This section presents background information for HPA, including a description and history of the facility, investigations conducted prior to and concurrent with the SI, and the physical characteristics of Parcel B.

### **2.1 Description and History of Naval Station Treasure Island, Hunters Point Annex**

HPA is in southeast San Francisco on a peninsula that extends eastward into San Francisco Bay (Plate 1). The Navy property comprises 965 acres, of which approximately 500 acres is on land and the rest is in San Francisco Bay. HPA is bounded on the north and east by San Francisco Bay and on the south and west by the Hunters Point district of San Francisco, which consists of public and private housing and commercial and industrial buildings. The north and east shores of HPA are developed for ship repair with dry docks and berths; there are no shipping facilities on the southwest shore.

HPA was operated as a commercial drydock facility from 1869 until December 29, 1939, when the property was purchased by the Navy. The Navy leased the facility to the Bethlehem Steel Company until December 18, 1941. On that date, the Navy took possession and began operating the shipyard to provide accelerated production of Liberty ships during World War II. Navy ships and submarines were also modified, maintained, and repaired there. HPA was also used for personnel training, limited radiological operations, research and development, ship design, and nonindustrial services for Navy personnel and their families. In 1974, the Navy ceased shipyard operations, placed the facility in industrial reserve, and transferred control to its Office of the Supervisor of Shipbuilding, Conversion and Repair, San Francisco.

Between 1935 and 1975, fill materials were placed in San Francisco Bay, increasing the land area of the facility from less than 100 acres to approximately 500 acres. Filling throughout HPA appeared to be complete by 1975. Aerial photographs indicate that extensive cut-and fill operations took place sometime between 1935 and 1948. Although documentation of the cut-and-fill operations is not known to exist, review of aerial photographs from the 1940s indicates that most of the cutting and filling probably occurred soon after the Navy took possession of the property in late 1941.

From May 1976 to June 1986, Triple A Machine Shop leased most of HPA from the Navy and operated a commercial ship-repair facility. Triple A subleased portions of HPA to private



warehousing, industrial, and commercial firms. Triple A refused the Navy's request to vacate when the lease expired and the Navy began legal proceedings to retake possession. Following action by the San Francisco District Attorney's Office (SFDA), Triple A vacated the facility in mid-1987. The SFDA charged Triple A with illegally disposing of hazardous wastes at about 20 locations throughout HPA (SFDA, 1986); none of these locations were in Parcel B. In 1992, Triple A was convicted on five counts of illegal hazardous waste disposal.

Between 1986 and 1988, the Navy considered homeporting the battleship USS Missouri at HPA. An extensive IR plan was developed and implemented during this period to expeditiously characterize the soil and groundwater contamination in parts of HPA as a prerequisite to development.

On the basis of the results of the investigations performed between 1986 and 1988, HPA was placed on the National Priorities List (NPL) in 1989 (EPA, 1990). As a result, the Navy is required to perform a Remedial Investigation/Feasibility Study (RI/FS) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). RI/FS activities are underway or planned for 20 IR sites at HPA as part of the IR program. These sites were divided into five operable units (OU) as defined in the Federal Facilities Agreement (FFA) signed January 22, 1992, by the Navy, the U.S. Environmental Protection Agency (EPA), and the State of California Department of Toxic Substances Control (DTSC) and Regional Water Quality Control Board (RWQCB), San Francisco Bay Region.

In 1990, the U.S. Department of Defense placed HPA on the Base Closure List, mandating that HPA be remediated and made available for nondefense use. HPA was designated as a "B" site by the Agency for Toxic Substances and Disease Registry (ATSDR) in 1991, meaning it poses no imminent threat to human health but has the potential to pose a long-term threat to human health.

In April 1992, the Navy proposed a new approach for the RI/FS program by which the HPA facility would be divided into five parcels (A through E) to expedite remedial action and land reuse. The approach is described in the *Technical Memorandum, Operable Unit V Redefinition* (HLA, 1992c). Table 1 presents the PA sites included in each of the parcels, the SI Work Plan volume number in which they are discussed, and the associated buildings or areas included at each PA site. This report discusses only Parcel B and the Drydock 4 area.

Parcel B encompasses about 66 acres along the northeast shoreline of HPA and is bounded to the north and east by San Francisco Bay (Plates 2 and 3). Galvez Avenue and Robinson Street separate Parcel B from Parcel A. Historical activities in Parcel B have included ship service and repair at the berths and drydocks, metal fabrication, a machine shop, an acid mixing plant, a tank farm for diesel fuel storage, sandblasting, photographic development, storage, office and maintenance facilities, a police station, a cafeteria, and dormitory housing.

Drydock No. 3 (located in Parcel C) separates Parcel B from Parcel C. Drydock 4 encompasses 13 acres and is located in Parcel C; it has been included in this report at the request of the Navy. Drydock 4 was constructed in the early 1940s and operated through the mid 1980s. Primary activities in this area included ship service, refitting, and sand blasting.

The locations of the six building sites are shown on Plate 3. PA-45 (steam lines), PA-50 (storm drains and sanitary sewers), and PA-51 (transformer locations) are found facility wide and cross parcel boundaries; the portions of these utilities identified in Parcel B are discussed herein. PA-46 (fuel distribution lines) is only in Parcel B. In addition to these PA sites, there are five IR sites in Parcel B: IR-6 (Tank Farm), IR-7 (Sub-Base Area), IR-10 (Electroplating and Battery Shop), IR-18 (Waste Oil Disposal Area), and IR-20 (Building 156). A summary of the investigations and findings at these sites is presented below.

## **2.2 Previous Investigations**

A number of previous studies at HPA have included evaluation of potential environmental problems in Parcel B. Table 2 summarizes suspected chemical usage in Parcel B, which was developed on the basis of the results of the investigations described below.

### **2.2.1 Surface and Subsurface Investigations**

The Navy's investigations at HPA began with an initial assessment study (IAS) in 1984 by WESTEC Services, Inc. (WESTEC, 1984). The IAS identified sites at HPA where hazardous materials were disposed or spilled because of past storage, handling, or disposal practices. The IAS included a review of available records on chemical handling and disposal practices, interviews with site personnel, and an on-site survey of evidence of former HPA activities. The IAS identified two sites in Parcel B, the Tank Farm (IR-6) and Building 123, the Battery and Electroplating Shop (IR-10). The Tank Farm was operated by the Navy between 1942 and 1974, supplying fuel and lube oil to the

berths along the north shoreline of HPA and receiving waste fuel and oil therefrom. Triple A also used the tanks for storage between 1976 and 1986. Building 123 operated as the submarine battery overhaul and storage shop as well as an electroplating shop from 1944 to 1974. The IAS recommended that confirmation studies be performed on (1) the soil and groundwater in the vicinity of the Tank Farm to evaluate the extent of petroleum hydrocarbon contamination and (2) the floor of Building 123, which may have been contaminated with lead particles from waste acids that were spilled onto the floor and into floor drains.

In 1987, a facility-wide study was conducted by EMCON Associates (EMCON) to identify areas containing asbestos and other organic and inorganic hazardous materials at potential construction sites at HPA (*EMCON, 1987b*). A total of five borings were drilled near PA-24. Chemicals detected in the shallow soil included SOCs and metals.

A second EMCON investigation in 1987 focused on verifying the presence of hazardous waste contamination at the sites recommended for additional investigation in the IAS (*EMCON, 1987a*). The work in Parcel B consisted of visual observations of the soil at the Tank Farm (IR-6), collecting and analyzing 18 floor scrapings and an air sample inside Building 123 (IR-10), and drilling 12 borings and installing 6 monitoring wells at the Sub-Base Area (IR-7). EMCON recommended additional work be performed at all three sites to further characterize the extent of contaminants.

In 1988, ERM-West conducted a fence-to-fence survey and inventory of suspected and known hazardous materials at the facility (*ERM-West, 1988*). All Navy and tenant facilities, including buildings, drydocks, piers, electrical substations, and open fields and lots were inspected. The investigation included Buildings 109, 113, 114, 125, 128, 130, 134, and Area XIV in Parcel B. The work did not include sampling or field testing of inventoried materials. The results of the investigation indicated improper storage, labeling, and containment in many of these buildings. No other areas of probable release or stored hazardous materials were found in Parcel B.

Sanitary sewers and storm drains throughout HPA were evaluated in 1988 in studies conducted by YEI Engineering, Inc. (YEI). The studies summarized the history of the systems and site conditions, and assessed the integrity of the two systems with particular regard to their adequacy to meet existing and future needs of several Navy projects (*YEI, 1988a, 1988b*). Although evaluating the presence of contamination in the systems was not included in YEI's scope of work, general reference was made to the presence of sanitary and industrial pollution within the two systems.

In 1991, HLA performed a stormwater investigation which included one location (Station SW1) in Parcel B (HLA, 1991). The laboratory results indicated the presence of VOCs, SOCs, Aroclor-1260, total petroleum hydrocarbons as diesel (TPH-D), total oil and grease (TOG), and metals.

During the preparation of the SI Work Plans in 1991, HLA made additional reconnaissance visits to portions of Parcel B. The visits focused on visual inspection of sumps, utility lines, tanks, trenches, storage areas, and localities where there was evidence of a chemical release or disposal.

HLA conducted Remedial Investigations (RI) at OU II Sites IR-6 (Tank Farm) and IR-10 (the Battery and Electroplating Shop - Building 123) and at OU IV Site IR-7 (Sub-Base Area) between 1988 and 1991 (HLA, 1992d, 1993a). The IR-6 investigation consisted of completing 34 borings and installing 16 wells. The IR-10 investigation consisted of completing 19 borings and installing 8 monitoring wells and 2 piezometers. The IR-7 investigation consisted of completing 36 borings, installing 6 monitoring wells, excavating 13 test pits, and collecting 8 shallow surface soil samples.

Prior to RI activities at IR-6, petroleum odors and visible contamination were noted in the surface soil near the 10 storage tanks at the Tank Farm. In the 1940s, diesel oil reportedly spilled from a ruptured tank and overflowed the berm surrounding the tank. Results of the RI at IR-6 indicate that VOCs, SOCs, TPH-D, TOG, PCBs, lead, and zinc are present in the soil and/or groundwater. Although the OU II report concluded that no immediate response action was necessary, additional work to evaluate the lateral and vertical extent of VOC contamination in the Bedrock Aquifer was recommended. The details of this work are described in Appendix M. A work plan and plans and specifications for a removal action of the tank contents, tanks, foundations, and nearby piping at the Tank Farm was prepared in 1993 (HLA, 1993b). Additionally, the lateral and vertical extent of VOC contamination in the Bedrock Aquifer was not defined. Further investigation to fill the data gaps has been recommended for IR-6 in Appendix M of this report.

At IR-10, the primary contaminants in the soil and groundwater were 1,2-dichloroethene (1,2-DCE), trichloroethene (TCE), perchloroethene (PCE), and vinyl chloride; the source of these chlorinated solvents has not been identified. The OU II report concluded for IR-10 that the lateral extent of VOC contamination in the A-aquifer downgradient of Building 123 was not defined. Additional work to evaluate the A-aquifer has been recommended for IR-10 in Appendix M of this report.

The primary contaminants observed at IR-7 consisted of two areas with TPH, SOCs, and TOG in the soil. An evaluation of cumulative health risk at IR-7 did not suggest potential health concerns (1993a).

Sites IR-18 (formerly PA-18), IR-20, and IR-22 comprise Group 6; only IR-18 and IR-20 are in Parcel B. In 1991 HLA conducted a Site Inspection (SI) at site PA-18 (Waste Oil Disposal Area). The SI was undertaken in response to past reports of disposal of waste oil on the ground surface by Triple A (*SFDA, 1986*) and analytical results of soil samples collected from six shallow borings by EMCON Associates (*EMCON, 1987a*). The SI investigation consisted of drilling 8 borings and installing 2 monitoring wells. VOCs, SOCs, PCBs, pesticides, TPH, and metals were detected in soil and the site was recommended for the Navy's IR program. To further characterize the lateral and vertical extent of these contaminants, to assess the possible presence of sandblast material, and to evaluate groundwater occurrence, flow direction, and gradients, RI work was performed at IR-18 in 1993. The RI investigation consisted of completing 10 borings and installing 2 monitoring wells. A zone of elevated TOG in the west portion of the site appeared to correspond to the location of a debris zone. A proposal for additional work at IR-18 was presented to the agencies on January 28, 1994 to address these issues and is summarized in Appendix M.

A Remedial Investigation was performed by HLA at Group 6 site IR-20 (Building 156) in Parcel B in 1993. The IR-20 investigation consisted of completing 13 borings and installing 3 monitoring wells; Aroclor-1260 above HBLs was detected in soil, and metals exceeding HBLs and IALs were observed in groundwater and grab groundwater samples. Additional work for IR-20 was presented to the agencies on January 28, 1994 and is summarized in Appendix M.

### **2.2.2 Air Quality Investigations**

As a component of the risk assessment performed by Aqua Terra Technologies (*ATT, 1987*), ambient air samples were collected at three locations in Parcel B in September 1987. The samples were analyzed for metals, asbestos, and organic compounds, including VOCs and SOCs. Several VOCs and SOCs were detected at all sampling locations. The compound detected in the highest concentration was toluene. Iron was detected at all three sampling locations; no other metals were detected. Asbestos was not detected.

In July 1991, HLA implemented an air sampling program at HPA that included collecting one sample in Parcel B near Building 146 (Location 6) and three samples near Drydock 4 (Location 10). Samples

were analyzed for VOCs, SOCs (including polychlorinated biphenyls [PCBs]), metals, and asbestos (HLA, 1992f). Five VOCs (acetone, methylene chloride, benzene, toluene, and xylenes) and one SOC (naphthalene) were detected in the samples. All detected concentrations were below EPA Region IX preliminary remediation goals for air contaminants (EPA, 1993). Barium, copper, lead, and mercury were detected in samples from Location 10 and asbestos was detected in the sample from Location 6.

## **2.3 Concurrent Investigations/Programs**

Several related investigations and programs are being conducted by the Navy concurrently with the ongoing SI and IR investigations at HPA. These consist of: (1) Phase I (PRC, 1992) and Phase II of the Underground Storage Tank (UST) investigation conducted by PRC which include the removal and/or closure of USTs, sampling of soil and/or groundwater in the vicinity of the USTs, and recommendations for RI work, and (2) the HPA grit fixation program which will stabilize both confined and loose sandblast grit, facility-wide, (3) the ecological risk assessment, (4) quarterly groundwater monitoring, (5) preparation of a facility-wide hydrogeologic report, and (6) Phase II air sampling, (7) a radiation waste characterization program, (8) an asbestos-abatement program, and (9) identification of sites (site assessment) potentially contaminated during the past 10 years that were not included in the SI or IR programs in Parcels B, C, D, and E. The results of all of these investigations/programs will be included in the Parcel B RI/FS.

## **2.4 Physical Characteristics of HPA**

This section summarizes current knowledge of HPA's physical characteristics with a focus on Parcel B. Specifically, the following subsections summarize the surface features and topography, geology, and hydrogeology.

### **2.4.1 Surface Features, Topography, and Surface Hydrology**

Much of the Parcel B land area is near sea level, ranging in elevation from about 6 to 12 feet mean sea level (MSL), but slopes upward to the south edge of the parcel with maximum elevations of about 40 feet MSL. The lowland areas were constructed by excavating portions of the nearby hillsides and placing fill along the bay margin. The former bay shoreline (1935) is shown on Plate 4. This shoreline was composed of bluffs just north of Innes Avenue, Galvez Avenue, and Lockwood Street. The shoreline is now approximately 400 to 800 feet to the north and is composed of several berths and drydocks. Most of Parcel B is covered by asphalt, concrete, buildings, or other structures. The

remainder is bare soil or is sparsely vegetated. Parcel B consists of tenant-occupied and unoccupied commercial and industrial buildings, and unoccupied residential buildings.

Surface water drainage appears to be primarily sheet-flow runoff that is collected by the onsite storm drain system and discharges into San Francisco Bay through several outfalls. Locally, some surface runoff may enter catch basins connected to the sanitary sewer system. Ultimately, such flows are discharged to the City of San Francisco sanitary sewer system. No naturally occurring channelized drainage exists; any preexisting drainage channels have been filled or modified by construction over the years.

#### **2.4.2 Geology**

On the basis of subsurface data collected during this and previous investigations, six geologic units underlie HPA, the youngest of Quaternary age and the oldest being Franciscan Assemblage of Jurassic-Cretaceous age. In general, the stratigraphic sequence of these units, from top to bottom, is as follows: Artificial Fill (Qaf); Slope Debris and Ravine Fill (Qsr); Undifferentiated Upper Sand Deposits (Quus); Bay Mud Deposits (Qbm or bay mud); Undifferentiated Sedimentary Deposits (Qu); and Franciscan Assemblage bedrock. A description of these units is in Appendix B.

The peninsula forming HPA is within a northwest trending belt of Franciscan Assemblage known as the Hunters Point shear zone (*Bonilla, 1971*). This belt extends diagonally through the City of San Francisco from Hunters Point to the south abutment of the Golden Gate Bridge. The rocks within this belt are intensely deformed and sheared. Serpentine is the predominant rock type, but other rock types characteristic of Franciscan Assemblage are also present. The contacts between different rock types are typically sheared.

The surface and near-surface soil in Parcel B is predominantly Artificial Fill ranging in thickness up to approximately 50 feet. The fill is primarily bedrock-derived from upland areas of Parcel A. Minor amounts of industrial fill are present in Parcel B at the west boundary of IR-18. At the east and west ends of Parcel B, in the areas of IR-7 and IR-20, the Artificial Fill is underlain by about 2 to 20 feet of Bay Mud Deposits. Bay mud units consist of soft, organic-rich plastic clay and silt with interbedded sand and peat. In the central portion of the site, the Artificial Fill is directly underlain by Undifferentiated Upper Sand Deposits or Franciscan Assemblage bedrock. Bedrock occurs at or near the ground surface along the south boundary of Parcel B. Slope Debris and Ravine Fill and Undifferentiated Sedimentary Deposits have not been encountered in borings in Parcel B.

### 2.4.3 Hydrogeology

For the purpose of this report, an aquifer is defined as saturated, relatively permeable (or interconnected fractures), native geologic, or manmade material that occurs at similar stratigraphic elevations, is relatively continuous in lateral extent, is of similar depositional origin, and appears to be in hydraulic continuity based on water-level data. The aquifers that have been identified at HPA are designated the A-aquifer, the undifferentiated sedimentary or B-aquifer, and the Bedrock Aquifer. The A- and B-aquifers are separated under most of the low-lying areas at the facility by 5 to 60 feet of Bay Mud Deposits. The fine-grained portions (clay and silt) of the bay mud generally act as an aquitard between the two aquifers.

The A-aquifer consists of saturated fill materials and Undifferentiated Upper Sand Deposits overlying bay mud. The A-aquifer may overlies bedrock in excavated areas adjacent to the former shoreline. In the lowland areas of Parcel B, this aquifer is generally unconfined to semiconfined, with depths to groundwater ranging from 2 to 15 feet below ground surface (bgs).

The B-aquifer consists of Undifferentiated Sedimentary Deposits underlying bay mud and overlying Franciscan Assemblage bedrock; it has not been encountered in Parcel B.

The Bedrock Aquifer is the upper weathered and deeper fractured portions of the Franciscan Assemblage (considered an aquifer in certain areas of the facility); this aquifer appears to be in direct hydraulic communication with the A-aquifer where the A-aquifer directly overlies it. Deeper fractured portions of the bedrock may also act as an aquifer. The bedrock aquifer in Parcel B was investigated previously during remedial investigation activities at Sites IR-6 and IR-7, but has not been fully characterized in the rest of the parcel (HLA, 1992d). The bedrock aquifer is probably semi-confined to unconfined where no overlying materials are present, and confined to semi-confined where buried by fill or native deposits.

Groundwater flow at HPA is complex due to the heterogeneity of the subsurface fill materials, tidal influences, effects of storm drain and sanitary sewer systems, and variations in topography. In some areas, the groundwater flow direction in the A-aquifer was observed to vary with tidal fluctuations, indicating groundwater exchange with San Francisco Bay (Plate 4).

Groundwater elevations calculated using water levels measured on August 16, 1993 in Parcel B are presented on Plate 4. The groundwater elevations in the A-aquifer ranged from -0.82 to 6.84 feet



MSL. Groundwater flow in the A-aquifer is generally north to northeast, towards San Francisco Bay. Along Lockwood Street, between IR-6 and PA-25, a groundwater depression was identified that coincides with the location of a sanitary sewer line. The sewer line appears to be dewatering the A-aquifer in this area. There are insufficient data to contour flow in the Bedrock Aquifer (there are three bedrock monitoring wells at Site IR-6 and one at Site IR-7), but groundwater likely flows from the bedrock high in the south at Parcel A, north toward San Francisco Bay. Gradients in the A-aquifer calculated using the August 1993 data ranged from  $3.9 \times 10^{-3}$  to  $8.0 \times 10^{-3}$  feet per foot (ft/ft). A gradient of  $1.2 \times 10^{-2}$  ft/ft was calculated for the Bedrock Aquifer using data from the three bedrock wells at IR-6. Vertical gradients between the Bedrock Aquifer and A-aquifer were upward during the August 1993 monitoring period.

No monitoring wells were installed during the SI or previous investigations at Drydock 4. However, wells were installed to the west at Sites PA-35 and IR-22 as part of other investigations. Groundwater flow in this area, as measured on August 16, 1993, was to the southeast toward San Francisco Bay near the shoreline, and in the west and northwest portions of PA-35 it was to the northwest, toward a groundwater depression that was probably caused by dewatering of the A-aquifer by the sanitary sewer system.

Findings from the HPA tidal influence monitoring program (TIMP) studies indicate a direct tidal influence on groundwater at IR-7, in the west portion of Parcel B, within approximately 200 to 400 feet of the shoreline (HLA, 1992g). The limits of tidal influence have not been established for the rest of Parcel B. Preliminary results of TIMP monitoring at Site IR-22, southwest of Drydock 4, indicate limited tidal influence most likely as a result of the presence of shallow bedrock.

### **3.0 FIELD, ANALYTICAL LABORATORY, AND DATA EVALUATION METHODS**

This section briefly describes the field, analytical laboratory, and data evaluation methods that were used at each of the PA sites during this investigation.

#### **3.1 Field Methods**

Field work for the SI program at Parcel B was conducted between January and September 1993 and in accordance with the SI Work Plans (*HLA, 1992a, b, e*). Changes in the scope of the SI during the field program at several PA sites were documented using the field variance process. The agencies were notified of the reason for the deviation from the work plan and given the opportunity to comment. Field variances were submitted regarding (1) suspected fuel lines at PA-46 (February 3, 1993), (2) several minor changes in sampling methods and additional sample locations throughout the Parcel B PA sites on the basis of observations from a site visit (February 23, 1993), (3) drilling difficulties at PA-51 (March 19, 1993), (4) sediment sample collection at PA-23 and PA-42 (both March 31, 1993), and (5) steam line inspection points at PA-45 (June 6, 1993). These field variances are included as Appendix A. Other deviations from the SI Work Plans using the field variance process are described below in the Field Investigation section for each PA, as appropriate. Table 3 is a list of all samples proposed for Parcel B in the SI and the status of those samples.

In general, the following methods were employed during the SI field work:

- Geophysical surveys to map fuel lines and locate suspected underground storage tanks (USTs)
- Soil borings and sample collection
- Monitoring well installation and development, groundwater sampling
- Shallow surface soil sampling (hand sampling)
- Trenching
- Steam line mapping and inspection
- Steam line liquid sampling
- Storm drain sediment sampling
- Sanitary sewer system map verification and inspection
- Video surveying of sanitary sewers

- Sanitary sewer liquid sampling.
- Sandblast material sampling
- Suspected asbestos material sampling
- Drum sampling
- Floor scrape sampling

Field work was performed in accordance with the HPA Site Safety Plan (*HLA, 1988a*) and the procedures described in the Quality Assurance Project Plan (QAPP; *HLA, 1988b*) which are described in Appendix C.

Borings and test pits were logged by a geologist using American Society of Testing and Materials (ASTM) Method D 2488-90, which is based on the Unified Soil Classification System, and standard geologic techniques. Test pits logs are presented in Appendix D, and boring logs and well completion details are presented in Appendix E.

### **3.2 Analytical Laboratory Methods**

Samples were analyzed by Anamatrix Laboratories in San Jose; Enseco Cal Lab in West Sacramento; ETC/Mid-Pacific in Mountain View; and Q Laboratories in Anaheim, all State-certified laboratories in California. A summary of analyses for each sample location and sample designation is presented in Table 4. Most samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SOCs), polychlorinated biphenyls (PCBs)/pesticides (PCB/pesticides), and metals. The analytical methods are listed in the analytical results tables presented in Appendix F (Tables F-1 through F-47) by PA site. Analyses for VOCs, SOCs, pesticides/PCBs and metals were conducted using Contract Laboratory Program (CLP) methods. The chemical data were reviewed for accuracy and precision and have been validated and assigned qualifiers as described in Appendix G; the qualifiers used are listed in Tables F-48 and F-49 in Appendix F.

### **3.3 Data Evaluation Methods**

Soil and groundwater chemical data from the Parcel B SI were evaluated to meet the objectives of the SI, as discussed in Section 1.1. Most notably the data were evaluated to identify (1) those contaminants related to point-source releases of contamination (i.e., a release to the environment had

occurred) and (2) sites for inclusion in the Navy's IR Program. Where appropriate, the data were also used to evaluate parcel- and site-specific hydrogeologic conditions.

Plate 5 is a flow chart illustrating the data evaluation process used to evaluate whether additional work is necessary. Detected concentrations of inorganics were compared to interim ambient levels (IALs) and detected concentrations of organic compounds were evaluated to assess if they were characteristic of nonpoint-source contamination (i.e., generally greater than nondetect). The methodology used to develop the IALs and resulting soil and groundwater IAL values were reported in HLA's Technical Memorandum, Background Soil and Groundwater Conditions (dated March 19, 1992) and updated in the Navy's Response to Comments on this document (dated June 19, 1992). Areas of contamination considered representative of nonpoint sources and adequately characterized are not proposed for further characterization. A site was considered to be inadequately sampled if samples could not be collected where maximum contamination from a release would be detected. For example, borings and/or surface sampling performed to evaluate soil conditions at a sump often could not be drilled where the maximum concentrations associated with a release would most likely be found (i.e., through the bottom of the sump) as a result of physical constraints such as sump structure/geometry, a confined space access problem, or the presence of fluids in a sump. In these cases, additional work was recommended at the site and work would be coordinated with NSTI to attempt to overcome the physical constraints noted during the SI.

Detected concentrations of organic compounds and inorganics greater than IALs were compared to noncarcinogenic health-based levels (HBLn; based on a hazard index [HI] of 1.0) and to carcinogenic HBLs (HBLc) corresponding to excess cancer risk levels from  $10^{-6}$  to  $10^{-4}$  for adult and child residents and commercial worker receptors. The HBL comparisons were performed on a compound by compound basis. Groundwater data were also compared to federal and state maximum contaminant levels (MCLs) (EPA, 1993). Sites or portions of sites where the data are sufficient for characterization and that do not show a potential health risk were not recommended for further investigation. Cumulative health risks for these sites are discussed in Section 8.0. Otherwise, the site was recommended for further investigation. The HBLs were developed by PRC; a summary of methods used to calculate the HBLs was presented previously in PRC's Parcel A SI Report, Appendix F (PRC, 1993). Cumulative health risks for all sites in Parcel B will be presented in the parcel RI report.

Detection limits and the presence and relative concentrations of tentatively identified compounds (TICs) were assessed as part of the data evaluation process. The TICs are included with the

analytical data tables in Appendix F; detection limits and TICs are discussed in the PA site summaries only in cases where they are relevant to the conclusions and recommendations.

Parcel B soil chemistry and groundwater data are presented on separate plates. Posted data comprise all detected organics, sum totals of carcinogenic and noncarcinogenic PAHs, where appropriate, and inorganics above IALs. The results of the comparison of the analytical results with the HBLcs are shown on the plates using color and alpha-coded boxes that represent the appropriate risk range and receptor, respectively; results are compared to the HBLns by the use of a triangle character and an alpha-coded box. The key to the health risk notation system is shown on Plate 6. Tables showing HBL, IAL, and MCL exceedances are in Appendix I.

It should be noted that for a few metals (e.g., arsenic and beryllium), the IAL of the metal is higher than the HBLc at  $10^{-6}$ . A detected metal concentration may, therefore, initially be considered during data evaluation, and then dropped from consideration because the concentration is considered within the typical range (i.e., below its IAL).

## **4.0 POTENTIAL CONTAMINANT MIGRATION PATHWAYS AND RECEPTORS**

This section describes general potential contaminant migration pathways and receptors at HPA. For PA sites that require no further action, these pathways and receptors are compared to specific analytical results of the SI in Section 8.0 (Risk Assessment Summary). For PA sites that will require further investigation, a comprehensive risk assessment for all of Parcel B will be presented in future RI/FS reports.

### **4.1 Potential Contaminant Migration Pathways**

A conceptual model of potential migration pathways was developed for organic and inorganic contaminants at HPA and is presented in HLA's *Operable Unit II Remedial Investigation Report* (HLA, 1992d). The migration pathways identified — air, surface water, soil, and groundwater — are summarized below.

#### **4.1.1 Air**

Contaminants may enter the air through volatilization and particulate entrainment. Chemicals may volatilize from contaminated soil, surface water, or groundwater depending on the temperature, atmospheric pressure, and contaminant properties. A volatile contaminant that has entered the air is transported by diffusion, or, more importantly by air phase flow (advection). Chemicals adsorbed onto fine-grained soil particles or existing as fine particulates may be entrained from the ground surface into the air as dust; these chemicals move with the prevailing wind and to a much lesser extent by dispersion depending on the wind speed and the mass of the soil particles. The extent to which chemicals are transported by air depends on their persistence in the air and the rate at which particulate matter settles out and is deposited.

#### **4.1.2 Surface Water**

In this report, surface water refers to surface runoff and water in the storm drains or sanitary sewers. Contaminants may enter storm drains and sanitary sewers by dissolution or suspension in surface runoff or by groundwater recharge. Surface water runoff or sewage may also leak from storm drain and sanitary sewer lines into unsaturated soil in areas where these lines are above the water table. Where the lines are below the water table, contaminated groundwater may infiltrate the storm drains

or sanitary sewers if local hydraulic heads are greater in the surrounding aquifer than in the lines, thereby inducing flow into the drains. Conversely, water or sewage may leak from the lines where the head is higher in the lines than in the aquifer. The degree of exchange between the lines and the soil and groundwater depends on tidal fluctuations, changes in groundwater levels, changes in the hydraulic head in the lines, and drain/sewer line integrity. Contaminated soil or groundwater entering the storm drainlines may be carried offsite to discharge at the storm drain outfall or, in the case of sanitary sewers, the City of San Francisco sanitary sewer system. The extent to which a chemical is transported by surface water depends on its mobility and persistence and whether contaminated soil particles are retained in storm drain and sanitary sewer sediment traps.

#### **4.1.3 Soil and Groundwater**

Chemicals may migrate in soil and enter the groundwater by (1) leaching and desorption from contaminated unsaturated soil by infiltrating rainwater, (2) gas phase molecular diffusion in the unsaturated zone, (3) vertical gravity- and density-driven transport of nonaqueous phase liquids (NAPLs) such as diesel and PCB-containing oils, (4) dissolution of NAPLs, and (5) desorption from saturated soil below the water table. The extent to which a chemical and its degradation products migrates in groundwater depends on their mobility and persistence and the direction and rate of groundwater flow (advection).

#### **4.2 Potential Receptors**

The discussion of potential receptors and exposure pathways presented in *Operable Unit II Public Health and Environmental Evaluation Report (HLA, 1992h)* was prepared to address these issues for the entire HPA facility and may be applied to the PA site investigations for the PAs in Parcel B. This information is summarized below; a complete risk assessment using data for all PA and IR sites will be presented in the Parcel B RI report.

Potential receptors that will be evaluated for inclusion in the risk assessment will consist of onsite and offsite workers, offsite residents, and hypothetical future onsite residents. General exposure pathways that will be considered will include the following:

- Ingestion of soil
- Ingestion of fruits and vegetables
- Dermal contact with soil

- Inhalation of dust emissions from soil
- Inhalation of volatile emissions from soil
- Ingestion of groundwater
- Dermal contact with groundwater during showering
- Inhalation of volatile emissions during showering
- Ingestion of surface water
- Dermal contact with surface water.

Ingestion of groundwater is not considered a primary exposure pathway because of the limited potential for use of groundwater as a drinking water source (see Section 2.4.3). Pathways related to surface water are also not considered important because surface water flows are primarily restricted to the storm and sewer system.

Groundwater and storm drain water flows into San Francisco Bay; potential aquatic ecological receptors and toxicity concerns will be addressed as part of the Ecological Risk Assessment (ECA), planned for 1994. The results of this investigation will be included in the Parcel B RI/FS.



## **5.0 DESCRIPTION AND RESULTS OF SITE INSPECTION ACTIVITIES - UTILITIES**

This section describes the SI activities performed at four utility systems in Parcel B and Drydock 4 (PA-45, steam lines; PA-46, fuel distribution lines; PA-50, storm drains and sanitary sewers; and PA-51, former locations of PCB-containing transformers). The work was conducted in accordance with Volumes I and III of the *Draft Final Site Inspection Work Plan: PA Other Areas/Utilities* (HLA, 1992b, e). Field activities were performed in accordance with procedures described in the QAPjP (HLA, 1988b) and are summarized in Appendix B of this report. Changes to the SI Work Plan were documented in accordance with the field variance process and are described in the summary of field work for each PA site as appropriate. Copies of the field variances pertaining to Parcel B and Drydock 4 are in Appendix A.

### **5.1 PA-45 (Steam Lines)**

The following sections present the history and a description of PA-45 as related to potential chemical contamination, discuss objectives of the SI, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.

#### **5.1.1 Site History and Site Description**

The HPA steam line system spans the entire shipyard. The system's primary function was supplying steam to heat buildings and ships docked at the facility; steam was also used to warm oil lines to facilitate flow. The steam line system was constructed approximately 40 years ago. Portions of the system were used until as late as 1984; it is no longer in use. Pipelines comprising the system are typically contained in concrete box culverts referred to herein as utilidors (utility corridors). The utilidors are covered by concrete panels with access points every 200 to 400 feet. The access points are typically 4 to 8 feet long and covered by removable steel slats. In some portions of the facility, the concrete panels and steel slats have been paved over.

The steam line utilidors house up to three types of pipes: (1) steam pipes, which carried pressurized hot steam and are covered with asbestos insulation in many areas of HPA; (2) condensate return lines, which collected the condensate in the steam lines; and (3) pump return lines, which recirculated the collected condensate back to the main boilers. Braces elevate all three types of piping above the concrete utilidor floor. Plate 7 is a typical cross section of a utilidor with all three types of pipes.

During its tenancy from 1976 to 1986, Triple A is suspected of having used sections of the abandoned steam line system to move waste oils containing PCBs (SFDA, 1986) from Drydock 4, Building 521 (Parcel E), and Berth 29 (Parcel D) to Tank S-505 (Parcel E). The affected lines (i.e., those through which the oil was pumped) appear to be only those segments of the system that link these areas. The affected lines are within Parcels C (the southeast corner of Drydock 4), D, and E.

Areas of study identified in the SI at PA-45 were:

- Utilidors
- Exteriors and interiors of the piping system
- Underlying soil

### **5.1.2 Objectives**

The steam lines were included in the SI program because of the suspected transportation of waste oil containing PCBs, which could potentially have been released to the environment. Therefore, the objectives of the SI activities related to the steam lines were to:

- Inspect the steam lines and evaluate whether contaminants were released to the soil, groundwater, or San Francisco Bay.
- Evaluate the need for conducting an RI
- Collect information to prepare removal plans, if appropriate.

### **5.1.3 Field Investigation**

The scope of work for the SI included: (1) verifying the system map and inspecting the pipelines; (2) accessing the interior of the pipelines to evaluate the presence and extent of oil; (3) sampling fluids encountered in the pipelines; and (4) trenching and soil sampling adjacent to utilidors where oil was identified in the lines and/or in the utilidor. A field variance dated June 6, 1993, described changes to the PA-45 investigation, including revising some sampling locations and replacing pipeline integrity testing with more frequent visual inspections of the utilidors and pipeline interiors. Visual inspections indicated areas where the pipeline was in poor condition; pressure testing of this system would likely have resulted in releases of oil through cracks in the pipelines to the surrounding utilidor. The field variance describes the visual inspection procedure: a ½-inch-diameter hole was drilled in the top portion of each pipe and its interior inspected using a

borescope (Olympus DES Borescope) at selected locations in Parcel B. Prior to drilling, each vault was inspected for the presence of friable asbestos.

The SI field investigation at PA-45 consisted of:

- Verifying steam line system map and inspecting the utilidor and exterior of the lines at 10 system access points (PA45ST200 through -ST209) in Parcel B (Plate 8B) and at six access points (PA45ST306 through -ST311) at Drydock 4 (Plate 9B and Table 5).
- Inspecting pipe interiors at four locations (PA45ST200 through -ST203) in Parcel B and at two locations (PA45ST306 and -ST307) at Drydock 4.
- Collecting water samples from a steam line and pump return line (PA45ST202) in Parcel B and a condensate line (PA45ST306) at Drydock 4, an oil/water mixture sample from a condensate line (PA45ST307) at Drydock 4 and an oil sample from a steam line (PA45ST307).
- Collecting an oil sample from a sump (PA45ST311) at Drydock 4.
- Excavating three test pits (PA45TA01, -TA09, and -TA18) immediately adjacent to utilidors which contained oil, and collecting samples at each (test pit logs are in Appendix D).

Additional steam lines are reportedly present immediately along the south side of Drydock 4; however, the area has been paved over and the utilidor could not be located nor the lines inspected in this area. These lines may have been inaccessible because they are enclosed in utility tunnels in the wall of Drydock 4.

#### **5.1.4 Summary of Results**

Samples were analyzed using the EPA methods shown in Table 4 and described in Appendix C. Keys to the steam line maps are shown on Plates 8A and 9A; sample locations are shown on Plates 8B and 9B. Validated analytical data for PA-45 are presented in Tables F-1 through F-6 (Appendix F) and include tentatively identified compounds. Comparisons to IALs are shown in Table I-1 (Appendix I).

The results of the field investigation are summarized below.

#### **Parcel B**

Water samples were collected from the steam line and pump return line at PA45ST202. Concentrations of VOCs, PAHs, TPH-d, TPH-g, TRPH, metals above IALs, and asbestos were detected

in the sample from the steam line (Plate 8B). All chemicals concentrations were below HBLs. No organic compounds were detected and inorganics were below IALs in the sample from the pump return. There was no evidence of oil contamination in the lines nor was there evidence of a release of water from the lines. No fluids were observed at the three other locations in Parcel B where the interior of the lines was inspected. Friable asbestos insulation was noted at PA45ST201.

#### **Drydock 4**

Low levels of VOCs, metals above IALs, and asbestos were detected in the two water samples from the condensate return line at PA45ST306 (Plate 9B). The sample of the oil/water mixture taken from the condensate return line at PA45ST307 detected VOCs, PAHs, TPH-d, TPH-g, TOG, and metals above IALs; all concentrations were below HBLs. The oil sample from this location had high concentrations of VOCs, PAHs, TPH-d, TPH-g, and TOG (Plate 9B). There are no HBLs for oil with which to compare these data.

The analytical results for the three soil samples from the test pits (PA45TA01, -TA09, and -TA18) indicated the presence of VOCs, PAHs, TPH-d, TRPH, and lead and zinc above IALs. No concentrations exceeded HBLs (Plate 9B) and no evidence of oil in the soil was observed in the excavations.

### **5.1.5 Discussion and Recommendations**

#### **Parcel B**

On the basis of the results of the SI field investigation, the steam line system in Parcel B was not involved in past waste oil transfers and no releases to the environment have occurred. Therefore, no further field investigation of the steam line system in this area is recommended. However, it is recommended that all lines be drained to minimize the potential for leakage of fluids still present in system lines. In addition, the removal of accessible friable asbestos is recommended. Table 6 presents these two recommendations for Parcel B.

#### **Drydock 4**

Further investigation of the steam line system near Drydock 4 is warranted. Waste oil was observed in the steam lines and adjacent utilidors at the southwest corner of PA-57. The steam lines along the

south wall of the drydock were not accessible for inspection and may be enclosed in utility tunnels instead of utilidors. This portion of the system should be mapped, inspected, and the contents of the lines inspected to evaluate the presence of oil. Borings or test pits may be required to evaluate potential leakage from the utilidors or utility tunnels to adjacent soil.

Removal of the oil-containing steam lines and concurrent investigation of the utilidor and underlying soil is recommended. Removal of accessible friable asbestos is also recommended.

Recommendations for the steam lines in the vicinity of Drydock 4 are summarized in Table 6.

## **5.2 PA-46 (Fuel Distribution Lines, Tank Farm)**

The following sections present the history and a description of PA-46 as related to potential chemical contamination, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.

### **5.2.1 Site History and Site Description**

Review of HPA facility maps indicates that four pipelines were used to transport diesel fuel to Berths 55 and 56 and both diesel fuel and lube oil to Berths 57, 58, and an abandoned pier, Berth 60, from the Tank Farm (Plate 10). Pipelines were also used to transport waste diesel fuel and waste lube oil from the berths back to the Tank Farm. According to facility maps, the clean lube oil and waste oil lines were 3-inch diameter lines and the clean diesel fuel and waste fuel lines were 4-inch diameter lines. HPA facility maps indicate that the branch of the lines that ran from Berths 57 and 58 to Berth 60 was abandoned before 1972. The lines that run from the Tank Farm to Berths 55 and 56 are no longer in use. Facility maps also indicate that the lube oil lines were abandoned in 1960. The methods of abandonment are not documented. At least one of the lines still contains product (HLA, 1992g). Pipelines were buried directly in the ground in most locations, in some limited areas pipelines are contained within utilidors. Field observations noted dark staining around a 4-inch diameter line at a subsided area at Berth 62.

### **5.2.2 Objectives**

The fuel distribution lines were included in the SI program because neither their physical integrity nor their contents had been evaluated. If the integrity of the fuel distribution lines has been

compromised, fuel could have been released to the environment. The objectives of the SI activities were:

- To inspect the fuel distribution lines and evaluate if contaminants have been released to the soil, groundwater, or San Francisco Bay
- To evaluate the need for conducting an RI
- To collect information to prepare removal plans, if appropriate

### **5.2.3 Field Investigation**

The field investigation focused on the following areas:

- Bends and junctions in the piping system (locations where leakage would most likely occur)
- Utilidors
- Underlying soil
- Suspected fuel lines at Drydocks 5, 6, and 7.

As discussed in the SI Work Plan, a geophysical survey was conducted to verify the location of the pipelines between the Tank Farm and the berths. Eleven test pits (PA46TA01 through -TA11) were excavated adjacent to the fuel lines; two of these test pits (PA46TA10 and -TA11) were excavated at the northwest and southwest corners of Building 134 (Plates 11, 12, and 13). At each test pit, the condition of the pipelines was recorded and soil samples collected immediately below the lines and at the water table, subsurface conditions permitting. The test pit logs are in Appendix D.

### **5.2.4 Summary of Results**

On the basis of visual inspections, where older lines ran through utilidors, the lines generally had been previously removed. Where lines were buried directly in the ground, they were abandoned in place.

On the basis of the geophysical surveys, the location of the fuel lines was verified along most of the alignment. No pipelines were observed in the area of suspected fuel lines near Drydocks 5, 6, and 7. However, fuel lines were located between Drydock 7 and the aboveground storage tanks (ASTs) at the northeast corner of Building 146 (Plate 13).

Fifteen soil samples were collected from below the fuel lines or adjacent to the bottom of the utilidors in test pits at PA-46. The samples were analyzed for CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-d, TPH-g, TRPH, CLP metals, and pH. Sample locations are shown on Plates 11 through 13. Validated analytical data for PA-46 are presented in Tables F-7 and F-8 in Appendix F; comparisons to HBLs and IALs are presented in Tables I-2 through I-4 in Appendix I. Hydrocarbons were observed in Test Pits PA46TA01 and -TA02, located in the Tank Farm area, during excavation. The analytical results show elevated concentrations of carcinogenic and noncarcinogenic PAHs and TPH (Plate 11). Other organic compounds were detected at low concentrations. Lead, antimony, copper, and zinc were above IALs. No HBLs were exceeded.

Samples from Test Pits PA46TA10 and -TA11, excavated along portions of the newer lines, had low concentrations of TPH, and lead, copper, and zinc above IALs. Aroclor-1260 was detected in each test pit at levels exceeding the HBLc at  $10^{-6}$  for adult resident receptors (Plate 11).

Analysis of soil samples from Test Pits PA46TA03 through -TA06, excavated to the water table along the old fuel lines, indicated the presence of PAHs and TPH, with concentrations much higher at or near the water table (Plates 11 and 12). The deep sample from PA46TA06 contained concentrations of TPH-g, exceeding the HBLc at  $10^{-6}$  for adult resident and commercial worker receptors.

Samples from Test Pits PA46TA07 and -TA08, excavated along the northeast side of Buildings 128 and 130, contained low levels of VOCs, PAHs, Aroclor-1260 and TPH as diesel. Samples collected below the fuel line between fuel tanks at Building 146 and the fuel pump on Berth 64 (PA46TA09) did not contain any organic compounds at elevated levels. Lead was detected slightly above its IAL (Plates 12 and 13).

### **5.2.5 Discussion and Recommendations**

There is no evidence to support the existence of fuel lines at Drydocks 5, 6, and 7 and therefore no further investigation is recommended in this area.

Soil samples from Test Pits PA46TA03 through -TA06 and soil samples from three borings and two wells (PA24B002, -B004, -B006, -MW02A and -MW03A) completed as part of the PA-24 site investigation (Section 6.3) generally contained low levels of VOCs, PAHs, and TPH. In general, concentrations of TPH were higher in samples collected at or just below the water table. A sample from nearby Boring PA24B004 contained TPH-g exceeding the HBLc at  $10^{-6}$  (Plate 12). Unknown

purgeable TPH was detected at 2,800  $\mu\text{g/l}$  in the groundwater sample from PA24MW03A. It is possible that the Tank Farm fuel lines may act as a source resulting in the presence of contaminants along the fuel lines, at the water table, and at the bay front. A conceptual cross section along the fuel lines is shown on Plate 14.

It is recommended that the fuel lines be drained of any remaining fuel oil and then removed along all alignments. Concurrently, the underlying soil should be sampled to assist in characterization. These data may then be used to perform a potential removal action of the contaminated soil. Further investigation (including soil and groundwater sampling) is recommended to evaluate the lateral and vertical extent of hydrocarbon contamination. As presented in Table 7, 15 Hydropunch borings are proposed along five transects (Plate 15). Soil and groundwater (Hydropunch) samples will be collected and analyzed. At the bay front 7, Hydropunch borings will have samples collected at the water table and deeper in the aquifer to evaluate chemical conditions and flux to the bay. After evaluation of the groundwater analytical data, locations for monitoring wells will be selected. It is estimated that between four and eight wells will be necessary to characterize the extent of contamination in the groundwater.

Soil data for Test Pits PA46TA01 and -TA02 show the presence of fuel oil directly adjacent to the fuel lines, indicating a probable point source release. This is consistent with previous observations at the Tank Farm. These data will be incorporated into the remedial action program already proposed for the Tank Farm soil.

Analytical results for samples from Test Pits PA46TA07 through -TA11 do not indicate that point source releases have occurred at these locations. No further investigation is recommended.

### **5.3 PA-50 (Storm Drain and Sanitary Sewer Systems)**

#### **5.3.1 Storm Drain System**

The following sections present the history and a description of the PA-50 storm drain system as related to potential chemical contamination, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.



### **5.3.1.1 Site History and Site Description**

The HPA storm drain system was originally part of a combined sanitary sewer and storm drain system that was constructed from 1942 through 1958. Separation of the storm drain system from the sanitary sewers began in 1958 and was largely completed by 1976 (YEI, 1988a). A study of the storm drain system (YEI, 1988b) concluded that several factors tended to adversely affect system integrity: (1) steep grades and an absence of hydraulic drops at manholes, resulting in excessive flow velocities; (2) decreasing pipe size in the downstream direction; and (3) former interconnections with sanitary sewers that resulted in the introduction of corrosive organic matter to the storm drain system. Although video surveying of the storm drains was not performed, video surveys of the sanitary sewers revealed poor conditions which YEI believed would also be present in the storm drain system.

Runoff that collects in Parcel B drains to San Francisco Bay. Parcel B is divided into three drainage areas, Areas B, C, and D (Plate 16B). Flow enters Parcel B from Parcel A through drainage areas B and D; discharge to San Francisco Bay is between Berths 55 and 64. Two small unnamed drainages in the vicinity of Buildings 140 and 142 discharge to the bay along the north side of Parcel B.

The drainage system includes concrete pipes, manholes, grated catch basins, and flood control structures. The system's physical integrity is generally subject to deterioration as a result of:

- Presence of corrosive organic chemicals
- Differential settlement of soil
- Seismic ground shaking
- Steep slopes.

Although the storm drain system is gravity flow, low ground surface elevations and tidal fluctuations inhibit efficient drainage. Tidal inflows affect pipelines inland approximately to the 1935 shoreline because flood control gates are largely inoperative (Plate 16B). Storm drain lines are below water levels during high tide in the northern half of Parcel B.

### **5.3.1.2 Objectives**

The storm drain lines were included in the SI program because a potential for release of contaminants to the environment from the lines was believed to exist. The most probably pathway for release was expected to be breaks or leaks in the lines. Previous investigation indicated that the

lines were used for the disposal of hazardous materials (HLA, 1990). In addition, the laboratory analysis of sediment samples collected during the stormwater investigation detected the presence of various VOCs, SOCs, metals, PCBs, and petroleum hydrocarbons (HLA, 1991). The objectives of the SI activities were:

- To inspect the storm drain lines and evaluate if contaminants have been released to the soil, groundwater, or San Francisco Bay
- To evaluate the need for conducting an RI
- To collect information to prepare removal plans, if appropriate.

### **5.3.1.3 Field Investigation**

The investigation consisted of visually inspecting manholes throughout the storm drain system in Parcel B and collecting sediment samples from the lines at selected manhole locations (HLA, 1992b) (Table 8 and Plate 16B). Sampling locations included catch basins, flood control structures, and access vaults along main trunk lines. Three additional sediment samples were collected from access vaults along branch lines as part of the PA-26 SI; ten were similarly collected at PA-57 (HLA, 1992e).

Accessible reaches of the system were video surveyed to identify breaks in the lines. Video surveying was not attempted on lines smaller than 12 inches in diameter, larger than 36 inches, or on lines containing obstructions or more than several inches of sediment. The camera was pulled on a cable between adjacent access points. The interior of the pipeline was continuously filmed and narrative was added to identify pipeline features and sections where a potential for leakage might exist. In Parcel B approximately 3400 feet of sewer line was video surveyed (Plate 16B). A summary of the video surveys is presented in Table 9.

Where video surveying indicated that the lines were in poor condition (i.e., cracked, separated at joints, groundwater infiltrating) and potentially leaking contaminated sediment or water to the surrounding soil, test pits were excavated to visually inspect and sample the soil adjacent to the line. Samples were obtained from at or below the pipeline invert or immediately adjacent to an observed break or crack. Four PA-50 test pits were excavated in Parcel B (PA50TA01, -TA02, -TA06, -TA07); test pit logs are in Appendix D.

#### **5.3.1.4 Summary of Results**

##### **Physical Condition**

Components of the storm drain system in Parcel B include access vaults (manholes), catch basins, and two flood control structures. Manhole inspections indicated the storm drain lines are constructed primarily of circular concrete pipe 12 to 33 inches in diameter. The flood control structures (PA50FC211 and -FC212) are intended to limit tidal inflow into storm drain lines and regulate runoff during storm events; however, they are rusted and appear to be inoperative. As a result, tidal inflow extends into the system to a distance approximately coincident with the 1935 shoreline. The key to the storm drain maps are shown on Plate 16A; sample locations are shown on Plate 16B.

Access vaults along the trunk lines are constructed of brick and concrete. One vault removed as part of the removal action at the Tank Farm (IR-6) did not have a solid bottom and may have acted as a wet well, allowing infiltration of runoff. Other access vaults may be of similar construction but thick accumulations of sediment have prevented clarification of this issue.

The video surveys of the storm drain lines indicated the presence of numerous cracks and minor separations at joints; major breaks were infrequent. Considerable sediment was present in the surveyed lines and sediment occasionally blocked the camera lens.

Storm drains traverse relatively steep cutslopes immediately south of Building 112 at the Tank Farm and near Building 114. In both locations, the lines are in very poor condition. Sewage appears to enter the storm drain system at PA50SW218 near the south edge of the Tank Farm (Table 9). Field personnel noted sewage materials and odors at this station; the source of the sewage was not determined. Navy control diagrams indicate that the sanitary sewer lines in this area intersect the storm drain system near PA50SW218. A possible interconnection was identified during the investigation of the sanitary sewer system as described below in Section 5.3.2.4.

##### **Analytical Results**

Six storm drain sediment samples were collected from storm drain trunk lines at PA-50 in Parcel B for the SI field investigation and analyzed for CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-d, TPH-g, TOG, CLP metals, and pH. A soil sample from each of the test pits was analyzed for the same

analytes. Additionally, three sediment samples were collected from storm drain branch lines at PA-26 and 10 were collected at PA-57. Sample locations are shown on Plates 17 through 20. On Plates 18 through 20, shallow soil sample data are also posted to allow evaluation of the contribution of this soil to storm drain sediment. Analytical results are presented in Tables F-9 through F-12 for the PA-50 soil and sediment samples. Comparisons to HBLs and IALs are presented in Tables I-5 through I-12 (Appendix I). Results are summarized by drainage area below.

### **Drainage Area B**

Sediment samples taken at PA50FC211 and PA50CB200 contained Aroclor-1260 and several metals above HBLs (Plates 17 and 18). The chemicals and concentrations observed in the sample from PA50FC211 correspond slightly to those observed in the surface soil sample from PA23SS04 at nearby Building 146 (Plate 18). Soil samples from the two test pits (PA50TA01 and -TA07) along Lockwood Street detected VOCs, TPH, and metals; however, the chemicals and concentrations detected do not correlate with those observed in the sediment samples taken from the lines.

### **Drainage Area C**

The sediment sample from PA50SW201 contained Aroclor-1260 above the HBLc for adult residents; TPH and metals were also detected (Plates 17 and 18). These results are typical of contamination observed in sediment samples taken elsewhere at HPA.

### **Drainage Area D**

This drainage receives runoff from a number of IR and PA sites, including IR-6 (Tank Farm), IR-10 (Building 123), IR-20 (Building 156), PA-25 (Building 134), and PA-26 (Building 157 and Area XIV).

Sampling location PA50SW203 is at the confluence of the entire Drainage Area D and is close to the outfall at Berth 55. No compounds were detected in excess of HBLs. Upstream from this location toward IR-6 and PA-25 at PA50FC212, Aroclor exceeded its HBL, and TPH were detected. Surface soil sample PA25SS04, located in the area that drains toward PA50FC212, had contamination somewhat similar to that observed at the flood control structure indicating that contaminant transport from surface soil to the storm drain has occurred (Plates 17, 20, and 21). A test pit soil sample from PA50TA06 located in Lockwood Street between sampling locations PA25SS04 and PA50FC212

contained organic compounds and petroleum hydrocarbons. These contaminants appear to be related to IR-6 contamination rather than leakage from the storm drain.

Samples from PA-26 were obtained from both Drainage Area D and a small unnamed drainage area outletting north of Drydock 3. Detected contaminants were typical of those detected elsewhere in Parcel B, with Aroclor-1260 and lead exceeding HBLs. Metals and organic compounds detected in a composite of sandblast samples (PA26SB06) were similar to contaminants observed in the storm drains except for TPH. Chemicals detected in a floor drain sample taken near Building 157 (PA26SW03) are similar to those detected in surface samples from that same building, suggesting either a pathway from the surface to the floor drain or that past site activities are responsible for similarly impacting the ground surface and the storm drain system. A sample from PA26SW05 exceeded the lead HBL; however the configuration of this manhole vault and its connection to the system remains uncertain.

#### **Drydock 4**

Drydock 4 drains northeast and southwest into Parcel C (Drainage Area F) and Parcel D (Drainage Areas G and I) respectively. Within the drydock areas, no storm drain sediment samples contained any chemicals at concentrations exceeding HBLs; however, PAHs, PCBs, TPH, TOG, and metals above IALs were detected. Similarities exist between metals detected at the different manhole locations; most commonly present are As, Pb, Cu, Zn, and Mo. A similar suite of metals was detected in sandblast samples.

#### **5.3.1.5 Discussion and Recommendations**

Tidal inflows, inoperative flood control gates and low pipeline gradients contribute to sediment accumulation in the storm drain system. Sewage appears to enter the storm drain system at one location (PA50SW218).

Pipeline sediment samples commonly have concentrations of Aroclor-1260 and lead that exceed HBLs. Soil sampling at pipeline breaks indicates that contaminants have not been transported out of the pipelines to the surrounding soil.

The specific recommendations for the storm drain system in Parcel B are presented in Table 10 and are summarized below:

- Evaluate the configuration of the system (manholes and catch basins) at contaminated sites and investigate the potential for releases
- Remove contaminated sediment from the system
- Complete the separation of the sanitary sewer and storm drain systems.

Plate 21 shows the proposed area of further investigation.

### **5.3.2 Sanitary Sewer Lines**

The following sections present the history and a description of PA-50 sanitary sewer lines as related to potential chemical contamination, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.

#### **5.3.2.1 Site History and Site Description**

HPA is served by a sanitary sewer system that collects facility-generated sanitary sewage and conveys it to the City of San Francisco's wastewater treatment system. The HPA sanitary system comprises 10 major reaches of pipe (Reaches 1 through 10) (YEI, 1988a). The individual reaches were originally defined to facilitate the engineering hydraulics analysis of the existing system. Reaches 1 through 9 are separate sewer subsystems that serve discrete portions of the facility. All nine reaches connect to Reach 10, which both serves a small portion of the facility and acts as the main trunk line for conveying sewage from the individual reaches to Pump Station "A" (Parcel A). Sewage is discharged from Pump Station "A" to the City of San Francisco sanitary sewer system at a manhole on Griffith Street.

The HPA sanitary sewer system was originally part of a combined sanitary sewer and storm drain system. Portions of the system was constructed from 1942 through 1958. Separation of the sanitary sewers from the storm drain system began in 1958 and was largely completed by 1976 (YEI, 1988a). Although the two systems are largely separated in Parcel B, two interconnections remain; one is discussed above in Section 5.3.1.4 and the second below in Section 5.3.2.4.

The Utility Technical Study performed by YEI in 1988 indicates that the sanitary sewer is in poor condition. The sanitary sewer collection system appeared to have many sags and dips in the sewer alignments, broken joints, eroded pipe bottoms, infiltration points, damaged manholes and construction deficiencies (YEI, 1988a).

The sanitary sewer system in Parcel B includes Reaches 1, 2, 3, and 10. Sewage from Parcels A and C enters the Parcel B system. The system is generally composed of cast iron, concrete or vitrified clay pipe 4 to 33 inches in diameter. The sewer system is largely below static water levels and therefore can act as a groundwater "sink." In addition, the sewer line backfill may act as a preferred path for groundwater flow because of its relatively high hydraulic conductivity.

#### **5.3.2.2 Objectives**

The sanitary sewer lines were included in the SI program because a potential for release of contaminants to the environment from the lines was believed to exist. The most probable pathway for release was expected to be breaks or leaks in the lines. Previous investigations indicated that the lines were in poor condition and that discharges of industrial wastes were occurring to the system (YEL, 1988a). The objectives of the SI activities were:

- To inspect the sanitary sewer system and evaluate if contaminants have been released to the soil, groundwater, or San Francisco Bay
- To evaluate the need for conducting an RI
- To collect information to prepare removal plans, if appropriate.

#### **5.3.2.3 Field Investigation**

An investigation of the sanitary sewer system was performed to evaluate whether the system (1) contained visible contamination, or (2) was receiving water from or leaking water to groundwater. The scope of work included: (1) inspection of all vaults in Parcel B and system map verification; (2) field observations to evaluate areas where water appeared to be leaking into or out of the lines and areas of visible contamination; (3) review of existing A-aquifer water-level contour maps to identify areas of water table mounding or depressions that might indicate flow into or out of the system; and (4) installation of monitoring wells in these areas to evaluate whether the sanitary sewer system is contaminating groundwater adjacent to the lines.

The sanitary sewer system was inspected at 36 vaults in Parcel B by removing manhole covers, monitoring the air space for organic vapors with an OVA, and recording the physical condition of the vault and flow conditions. As part of the inspections, the sewer access locations were sketched, photographed, and compared to available Navy Control Diagrams (undated). Inspection locations are shown on Plate 22 and observations summarized in Table 11.

Two sewer vaults were identified near vacant buildings where the lines inexplicably contained flow: PA50SN206 and -SN233 (Plate 22). Both sites are in the lowlands near the bay and within the area of tidal influence. The flow was interpreted as groundwater leakage into the system or inundation of the system by bay water. During low tides there is the potential for flow out of the system, possibly transporting contaminants out of the system.

To evaluate groundwater quality and the potential for flow into and out of the sewer system near these vaults, two monitoring wells were installed. Well PA50MW01A is adjacent to PA50SN206 and Well PA50MW02A is adjacent to PA50SN233 (Plate 22). Water samples were collected from the monitoring wells and from the sanitary sewer at PA50SN206 and analyzed for CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-d, TPH-g, TOG, CLP metals, fecal coliform, and pH. Water was not present in PA50SN233 after the initial observation despite several attempts at sampling. Soil boring logs and well construction details for wells PA50MW01A and -MW02A are included in Appendix E.

Review of previous A-aquifer water-level contour maps indicated an area between Building 134 and the Tank Farm (IR-6) where the water table was depressed adjacent to the sanitary sewer (HLA, 1992d). Well IR06MW34A, located close to the sanitary sewer in this area, was sampled and used to assist in the assessment of flow conditions and potential contamination of the sewer system. Because no sanitary sewer vaults are present in the immediate area where the water table was depressed, PA50SN235 was sampled; this vault is approximately 250 feet down-system from the well. Samples were analyzed for the analytes listed above.

#### **5.3.2.4 Summary of Results**

No visible contamination other than sewage was observed in the lines during the inspection of the 36 vaults (Table 11). Groundwater, sewer water, and sediment sample chemical results are presented on Plate 22. Comparisons to HBLs, IALs, and MCLs are shown in Tables I-13 through I-25 (Appendix I). All detected concentrations are presented in Appendix F, Tables F-13 through F-18. Results are summarized below.

No inorganics above IALs and no organic compounds were detected in the groundwater sample from PA50MW01A. Only toluene was detected in the sewer water sample from PA50SN206 at a concentration below the HBLn; no inorganics were detected above IALs. No fecal coliform was detected in either the well or the sewer water.



No inorganics above IALs, no organic compounds, and no fecal coliform were detected in the sample from PA50MW02A. The vault at PA50SN233 was dry during several sampling attempts after the initial observations and could not be sampled.

SOCs were detected in the sample from IR06MW34A, but were below HBLs; neither inorganics above IALs nor fecal coliform were detected. Low levels of VOCs and metals were detected in the water sample from PA50SN235.

The analytical results for the sediment sample from PA50SN201 indicate that Aroclor-1260 values exceed the  $10^{-6}$  to  $10^{-4}$  HBLc and the HBLn, and mercury exceeds the HBLn.

A possible interconnection with the storm drain system was identified at inspection station PA50SN217 (Table 11). Flow from a storm drain appears to enter the sanitary sewer system at this location (Plate 22).

#### **5.3.2.5 Discussion and Recommendations**

There is no evidence of chemical contaminants in the sanitary sewer system in Parcel B. However, water-level elevation contour maps and sewer water analytical results (i.e., PA50SN235) indicate that the sanitary sewer system and backfill appears to act as a sink and is possibly collecting and transporting groundwater from VOC plumes at IR-6. Therefore, it is recommended that the pathway be confirmed and the source area be identified by sampling sewer vaults up-system of PA50SN235 (Table 12).

### **5.4 PA-51 (Former Transformer Sites)**

The following sections present the history and a description of PA-51 as related to potential chemical contamination, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.

#### **5.4.1 Site History and Site Description**

PA-51 consists of buildings or areas throughout HPA that formerly housed transformers containing PCBs. Removal activities and field investigations have been performed at various transformer locations throughout HPA. In 1988, 199 transformers were removed from service by American

Management Corporation and the Navy Public Works Department (NPWD). Typed and handwritten memos and tables discussing the removal of these transformers were presented in Appendix E of the PA Other Areas/Utilities Report (HLA, 1990). These records indicate that 48 of the 199 transformers were removed from their original locations and stored near Building 524. Although the records also indicate these transformers were later removed from HPA for disposal, the original locations of the transformers were not documented.

An extensive inventory and investigation at the transformer locations was conducted by YEI in 1988. During this investigation, all known oil-containing equipment at HPA was inspected, inventoried, and sampled. The results of the investigation were presented in YEI's Electrical Equipment Containing Oil, Master Inventory Survey Report (1989). The YEI investigation identified 162 pad- and pole-mounted transformers at 78 locations throughout HPA. Forty-one of those transformers were identified as containing PCB oil (>500 ppm), based on the manufacture's specification labels. One hundred and eighteen transformers were sampled for PCBs, of which 31 contained PCB-contaminated oil at 50 to 500 ppm, 4 contained PCB-contaminated oil at greater than 500 ppm, and 83 contained non-PCB-contaminated oil at less than 50 ppm, as defined by EPA regulations in Title 40, Code of Federal Regulations, Part 761, and 52 Federal Register 23397 for oil in electrical equipment.

#### **5.4.2 Objectives**

The former transformer sites were included in the SI program because there is no information on these sites to indicate whether any oil containing PCBs was released at the sites prior to transformer removal. The objectives of the SI activities were:

- To inspect each former location and evaluate whether contaminants have been released to the soil
- To evaluate the need for conducting an RI.

#### **5.4.3 Field Investigation**

Sequentially, the SI activities conducted at the PA-51 sites involved the following: (1) a literature search to identify former PCB-containing transformer locations not listed in Exhibit 51 of the SI Work Plan (HLA, 1992), (2) a review of the 118 transformer locations listed in Exhibit 51 and site visits to those that had building names associated with them, (3) interviews with Navy and Navy Public Works Center personnel in an attempt to correlate the transformers whose original locations were

unknown to those that were stored at the Building 524 yard, and (4) site visits to identify possible former and newly replaced transformer locations. In accordance with the SI Work Plan (HLA, 1992e), upon identification of former transformer locations, soil in the vicinity of the transformer pads or beneath the transformer poles was inspected for visual evidence of contamination (such as stains or oily substances). Transformer pads and the pavement below transformer poles were inspected for cracks if contamination on the pads was observed. Samples were collected as appropriate.

#### **5.4.4 Summary of Results**

Results of the literature search, interviews, and site visits revealed 12 transformer locations in Parcel B; no former transformer locations were identified at Drydock 4. These locations and a description of the physical conditions are presented in Table 13. On the basis of visual observation, a release to the environment was noted and surface samples were collected at seven of the locations and analyzed for CLP PCBs. Two of the seven locations corresponded to the Exhibit 51 list; the remaining five locations are either former transformer locations not listed in Exhibit 51 or locations where transformers are currently stored. Sample locations and results are shown on Plate 23. Validated analytical data for PA-51 are presented in Table F-19 in Appendix F. Tables I-26 through I-29 (Appendix I) present a summary of the HBL comparisons.

At PA51SS01, located northeast of Building 125, Aroclor-1242 was detected at 0.3 mg/kg. Although no HBLs have been developed for Aroclor-1242, the detected concentration was compared to the HBLs established for Aroclor-1260. This comparison revealed that the detected concentration exceeds the HBLc at  $10^{-6}$  for adult resident and commercial worker receptors.

Aroclor-1260 was detected in samples PA51SS02 and -SS03 collected in Building 128, at 15 and 0.45 mg/kg, respectively. PA51SS02 exceeded the HBLc at  $10^{-5}$  and the HBLn for child resident receptors and the HBLc at  $10^{-4}$  for adult resident and commercial worker receptors. The detected concentration in PA51SS03 exceeds the HBLc at  $10^{-6}$  for all three receptors.

No PCBs were detected from the samples collected at the transformer locations at Building 113 (PA51SS04) or Building 122 (PA51SS06 and -SS07). Aroclor-1260 was detected at PA51SS05 at 0.034 mg/kg; no HBLs were exceeded.

#### **5.4.5 Discussion and Recommendations**

On the basis of visual observation and the analytical data, a release of PCBs to the soil below the transformer appears to have occurred at PA51SS02 and further investigation is recommended in this area. The proposed work is summarized in Table 14 and are shown on Plate 24. The work consists of an exploratory excavation to evaluate and/or remove the lateral and vertical extent of PCB contamination at this site. A description of the exploratory excavation process is provided in Appendix J.

Although PCBs were detected at PA51SS01, -SS03 and -SS05, the concentrations are low and the only HBLc exceedance is at  $10^{-6}$ . In addition, the HBL exceedance at PA51SS01 is based on a comparison of the HBLs for Aroclor-1260 to the detected concentration of Aroclor-1242. This comparison represents a conservative evaluation of health risk associated with Aroclor-1242. No PCBs were detected at PA51SS04, -SS06, -SS07. No further work is recommended at any of these sites.

## 6.0 DESCRIPTION AND RESULTS OF SITE INSPECTION ACTIVITIES - BUILDING SITES

The following sections present the objectives of the SI activities at the building sites in Parcel B, site histories and descriptions of each building and associated USTs, SI field activities performed at each site, a summary of results, and a discussion concluding with recommendations for additional RI field work, where necessary. Proposed RI work plans for the building sites are presented at the end of each discussion section.

Field activities conducted at USTs associated with building sites and results of the HPA UST Program for Phase I activities were reported in *Final Summary Report of UST Removals* (PRC, 1992), and for Phase II activities presented to the regulatory agencies by PRC on July 27, 1993. Brief summaries of the findings of the UST Program investigations are presented following the discussion. The case scenarios (Case I, II, and III) presented by PRC in the Parcel B UST investigation presentation were developed to categorize levels of contamination detected in soil and groundwater samples collected at the UST sites. The case scenarios for soil samples are presented below:

Case I    VOCs or SOCs < 1 ppm; Install 1 to 3 groundwater monitoring wells

Collect 1 to 3 soil and groundwater samples

Case II    1 ppm < VOCs or SOCs < 10 ppm; Install 3 groundwater monitoring wells

Place 3 to 6 geoprobes

Collect 6 to 9 soil and groundwater samples

Consider limited excavation, if warranted

Case III    VOCs or SOCS > 10 ppm

Install 3 to 6 groundwater monitoring wells

Place 12 geoprobes

Collect 15 to 18 soil and groundwater samples

To merge the SI and UST field investigations into a comprehensive parcel-wide RI field investigation, the proposed case scenarios for the USTs were reviewed and integrated into the proposed RI activities for the building sites. In some cases, borings or wells may have been eliminated because of overlap with proposed RI sampling locations.

The following is a list of USTs and associated building sites in Parcel B:

UST 2 (S-135)                      Building 116

UST 3 (S-136)                      Building 146

## **6.1                      Objectives**

The objectives of the SI activities conducted at the six PA building sites in Parcel B and the Drydock 4 area were to:

- Evaluate whether a release of chemicals to the environment (soil or groundwater) has occurred in areas where information indicate past or present activities may have resulted in a release
- Evaluate the need for conducting an RI at the sites.

## **6.2                      PA-23 (Building 146, former Building 161, and former Building 162)**

The following sections present the history and a description of PA-23 as related to potential chemical contamination, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.

### **6.2.1                      Site History and Description**

PA-23 consists of one existing building, the Photograph Development Laboratory (Building 146) and two demolished building sites, the former Maintenance Service Center (Building 161), and the former Paint Storage shed (Building 162) (Plate 25).

The building and former building sites were inspected by HLA in February and March 1991, during preparation of the Work Plan, and at the onset of the SI investigation in January 1993. The observations during these inspections are as follows:

#### **Building 146**

Several fume hoods on the first and second floors indicate historical chemical use. Two floor plates, unmovable without proper equipment, were identified in the northwest part of the building. A fuel pump observed at the north exterior corner indicates the probable presence of an UST beneath the nearby pavement. Two ASTs, assumed to have stored diesel and heating oil, are located in a

secondary containment at the northeast corner. Dispensing hoses from these tanks, however, are not contained and spillage to an adjacent storm drain is apparent. At the southeast corner, three ground-level compartments (sumps) with sealed lids have paint or resin on the ground surrounding them. Surface staining is present on the asphalt along the northwest exterior of the building.

### **Building 161**

This building has been demolished. The building site is soil-covered and similar to the surrounding area. No indications of spills or releases were observed; however, the building name suggests the possible previous use/storage of hazardous materials.

### **Building 162**

This building has been demolished. Field observations during preparation of the work plan indicated that soil at the former building site had been excavated to create a boat ramp (*HLA, 1992e*).

### **UST Sites**

A 1,250 gallon steel UST (UST Site 2) that was approximately 8 feet northeast of Building 116 and a 750 gallon steel UST (UST Site 3) that was approximately 45 feet south of Building 146 were removed in May 1993 as part of Phase II of the HPA UST Program. The tanks historically contained fuel oil. Recommendations for further investigation were classified Case III at UST Site 2 and Case II at UST Site 3; descriptions of the case scenarios are presented above in Section 6.0.

### **6.2.2 Field Investigation**

The field investigations at Building 146 and former Building 161 were developed on the basis of field observations and historical information. Because soil was excavated from the location of former Building 162, no potential chemical releases were observed and, therefore, no field work was proposed in the work plan (*HLA, 1992e*). The investigation at Building 146 consisted of collecting samples of the contents of the two ASTs (PA23TK01 and PA23TK02) and three surface soil samples as follows:

- One sample beneath the AST dispensing hose (PA23SS07)
- One sample of the stained pavement (PA23SS05)

- One sample adjacent to the sumps (PA23SS04).

The sample locations are shown on Plate 25. In addition, a sample from the storm drain beneath the dispensing hose was planned, as outlined in Volume III of the SI Work Plan (HLA, 1992e); however, no sediment was present, therefore, the sample could not be collected.

The floor plates in the northwest portion of the building were lifted and the area beneath them inspected. The area contained no sediment or debris and no evidence of contamination was observed; no samples were collected.

The field investigation at Building 161 consisted of collecting three surface soil samples across the site and compositing them into one sample (PA23SS06) for analysis (Plate 25). Samples were collected on January 20, 1993.

### **6.2.3 Summary of Results**

Four soil samples were collected at PA-23 and analyzed for CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-d, TPH-g, TOG, CLP metals, and pH. Soil samples were analyzed using the methods indicated in Appendix C. Sample locations and results are shown on Plate 25. Validated analytical data for PA-23 are presented in Tables F-20 and F-21 in Appendix F and include tentatively identified compounds. Comparisons to HBLs and IALs are presented in Tables I-30 through I-34 in Appendix I.

### **Building 146**

Sample PA23SS04, collected adjacent to the sumps, contained low concentrations of carcinogenic and noncarcinogenic PAHs, pesticides, PCB, TOG, and metals above IALs. HBL exceedances are as follows:

- Benzo(a)pyrene exceeded the HBLc at  $10^{-6}$  for adult resident receptors.
- DDT exceeded the HBLc at  $10^{-6}$  for adult resident and commercial worker receptors
- Aroclor-1260 exceed the HBLc at  $10^{-6}$  for all three receptors.
- Arsenic exceeded the HBLc at  $10^{-5}$  for all three receptors and the HBLn for child resident receptors.
- Lead exceeded the HBLn for child resident receptors.



The sample from PA23SS05, collected beneath the stained asphalt, detected carcinogenic PAHs, unknown extractable TPH, TOG, and metals above IALs. Benzo(a)pyrene was detected at 0.1 mg/kg, which exceeds the HBLc at  $10^{-6}$  for adult resident and commercial worker receptors.

The soil sample collected beneath the AST dispensing hose (PA23SS07) showed only very low concentrations of DDD, TPH as motor oil, and copper above the IAL. No HBLs were exceeded.

### **Former Building 161**

Three samples were collected from across the former location of Building 161 and composited for analysis by the laboratory (PA23SS06). Results show low levels of carcinogenic and noncarcinogenic PAHs, pesticides, Aroclor-1260, unknown extractable TPH, TOG, and metals above IALs. HBL exceedances are as follows:

- Benzo(a)anthracene and benzo(b)fluoranthene exceeded the HBLc at  $10^{-6}$  for adult resident receptors; benzo(a)pyrene exceeds the HBLc at  $10^{-6}$  for adult resident and commercial worker receptors
- Aroclor-1260 exceeded the HBLc at  $10^{-6}$  for adult resident receptors
- Beryllium exceeded the HBLc at  $10^{-6}$  for child resident and commercial worker receptors and at  $10^{-5}$  for adult resident receptors
- Vanadium exceeded the HBLn for child resident receptors.

### **UST Sites**

Soil samples collected during the tank removal at UST Site 2 contained high levels of SOCs. Soil samples from UST Site 3 contained high levels of SOCs and low levels of TPH. Groundwater was not encountered during the tank removal at either excavation site.

## **6.2.4 Discussion and Recommendations**

### **Building 146**

Samples PA23SS05 and PA23SS07, collected beneath the stained pavement and the AST dispensing hose, respectively, were located where the maximum concentrations associated with a point source release would be expected. Because the types of compounds and their respective concentrations detected in these samples are comparable to other observations of nonpoint source contamination at

HPA, no further work is recommended in these areas. However, visual observations made during the field investigation of the area beneath the ASTs and within the secondary containment indicate shallow contamination. An additional investigation is recommended after the tanks have been removed. The details of this proposed work are presented in Table 15 and Plate 26.

The integrity of the sump structure at PA23SS04 is unknown and field observations made during this investigation could not clarify its integrity. In addition, the soil sampled at the sumps was collected adjacent to the sump structure and is most likely not representative of the maximum concentrations associated with a point source release. However, the analytical results for the sample collected indicate that a release has likely occurred.

As summarized in Table 15 and shown on Plate 26, an exploratory excavation is recommended to evaluate and possibly remove contaminated soil associated with the potential release from the ASTs and sumps. The exploratory excavation procedure is described in Appendix J.

### **Former Building 161**

Because the sample from PA23SS06 was a composite, the analytical results only provide an indication of potential contamination at all three locations. In addition, the types of chemicals detected (PAHs, vanadium, TOG, and Aroclor) are indicative of waste oil. This information combined with the historical use of the former building indicate a point source release may have occurred; an exploratory excavation is recommended in this area to evaluate and possibly remove associated contamination (Table 15 and Plate 26). The details of the exploratory excavation procedure are outlined in Appendix J.

### **UST Sites**

On the basis of the SOCs and/or TPH in soil at UST Sites 2 and 3, additional RI work is proposed. The RI work plan is presented in Table 15 and shown on Plate 26 and consists of soil and groundwater samples collected from proposed boring/Hydropunch locations around the perimeters of the USTs.

### **6.3 PA-24 (Former Building 124, Building 125, Building 128, and Building 130)**

The following sections present the history and a description of PA-24 as related to potential chemical contamination, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.

#### **6.3.1 Site History and Description**

Site PA-24 is a 10-acre rectangular site in the north half of HPA, immediately east/northeast of Site IR-10 and adjacent to San Francisco Bay (Plate 27). PA-24 consists of four buildings and the asphalt-paved areas adjacent to them as follows:

- Building 124 - Acid Mixing Plant (destroyed)
- Building 125 - Submarine Cafeteria
- Building 128 - Shop Service & Work Control Center No. 1
- Building 130 - Shop Service

A brief history of each of the buildings is presented below.

#### **Building 124**

Building 124 was an acid mixing plant where there were reportedly five wooden, aboveground storage tanks containing sulfuric acid (1 tank), distilled water (2 tanks), and electrolytes (2 tanks). The building was located between Buildings 123 (IR-10) and 134 (PA-25); its former location is shown on Plate 27. The building was demolished and the tanks were removed; however, there is no documentation of the tank removals.

#### **Building 125**

Building 125 was the Submarine Cafeteria, which is no longer in operation. The building is currently leased to a vinegar-making company and a woodworking shop. A photographer and an artist also occupy sections of the building.

### **Building 128**

Miller Pipeline currently has two workshops in the southeast portion of Building 128. Previously inventoried chemicals include oils, solvents, corrosives, and hydrocarbons. Two transformers are present in a room in the northeast corner of the building; these transformers were investigated as part of PA-51 and were discussed in Section 5.4. The federal Drug Enforcement Agency (DEA) occupies the northwest half of the building and uses it to store impounded vehicles. Contaminated runoff was reported for this site in the Fence to Fence Survey by ERM-West (1988).

### **Building 130**

The northwest half of Building 130 was formerly occupied by Engel Engineering and the south half is leased by Protective Finishes Company. Various chemicals are stored in the area occupied by Protective Finishes and poor housekeeping practices are evident. Past inventoried chemicals include oils, paints, methyl ethyl ketone (MEK), toluene, xylenes, and other solvents. Two sumps are located in the building.

## **6.3.2 Previous Investigations**

Four shallow soil borings were drilled by EMCON within the boundary of Site PA-24 and one boring was drilled just outside the site boundary northwest of Building 125 (Plates 27 and 39) (EMCON, 1987b). The borings were drilled to depths of approximately 5 feet bgs. Soil samples were collected from 2 feet bgs and analyzed for SOCs, metals, and asbestos. SOC compounds and metals were identified in the soil samples. Manmade asbestos fibers were detected in soil samples from two of the borings.

HLA's Remedial Investigation activities at OU II Sites IR-6 and IR-10 included drilling and sampling three soil borings and seven monitoring wells within the Site PA-24 boundary (Plate 27). Concentrations of SOCs, VOCs, TPH as diesel, TOG, and metals were detected in the soil and groundwater samples (HLA, 1992d). Hexavalent chromium was detected in one soil sample.

## **6.3.3 Field Investigation**

On the basis of the previous investigations, the following data needs were identified:

- Potential presence, concentrations, and distribution of organic chemicals in soil and groundwater
- Occurrence of manmade asbestos in soil
- Occurrence of metals in soil above background concentrations
- Groundwater flow direction and gradient.

The field investigation activities at PA-24 included an investigation of the soil and groundwater adjacent to previously sampled EMCON borings, beneath the two sumps, adjacent to buildings, and in areas of observed staining. Sample intervals, depths, and locations are shown on Plate 27. Specifically the field program consisted of the following:

#### **Building 124**

No work was performed at the former building site because the area was investigated during the RI at nearby sites IR-6 and IR-10. Additional work was recently performed in the vicinity of the former building site as part of the PA-25 site investigation at Building 134 (Section 6.4).

#### **Building 125**

The SI field investigation at Building 125 consisted of drilling two borings, one of which was completed as a monitoring well. The sampling rationale was as follows:

- Boring PA24B001 was located adjacent to a grease trap on the northwest side of the building to assess soil chemistry
- Monitoring Well PA24MW01A was located near a transformer pad north of the building; the transformer pad itself was investigated as part of PA-51 (see Section 5.4 above).

#### **Building 128**

The SI field investigation at Building 128 consisted of drilling five borings, one of which was completed as a monitoring well. The sampling rationale was as follows:

- Borings PA24B002 and -B003 were drilled to assess soil chemistry in areas of poor housekeeping
- Borings PA24B004 and -B005 and monitoring well PA24MW02A were drilled in areas of observed staining and to assess soil chemistry in the vicinity of the transformers located in the northeast corner of the building; the transformer pad itself was investigated as part of PA-51 (Section 5.4).

## **Building 130**

- Boring PA24B006 was drilled to assess soil chemistry in the vicinity of the transformers located at the northeast corner of the building; the transformer pad itself was investigated as part of PA-51 (Section 5.4)
- Borings PA24B007, -B008, -B009, and -B010 were drilled to assess soil chemistry in areas of poor housekeeping practices
- Monitoring Well PA24MW01A was installed to evaluate soil and groundwater chemistry near a sump with a history of solvent odors.

### **6.3.4 Summary of Results**

Fifty-seven soil samples and four groundwater samples were collected at PA-24 and analyzed for CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-d, TPH-g, TOG, CLP metals, asbestos, and pH. Samples were analyzed using the methods described in Appendix C. Sample locations and analytical results for soil are shown on Plate 27; analytical results for groundwater are shown on Plate 28. Validated analytical data for PA-23 are presented in Tables F-22 through F-25 in Appendix F and include tentatively identified compounds. Comparisons to HBLs, IALs, and MCLs are presented in Tables I-35 through I-42 (Appendix I).

## **Building 125**

All five samples from PA24B001 contained low levels of TOG ranging from 130 to 670 mg/kg. No HBLs were exceeded.

Three of the six soil samples collected from PA24MW01 had low concentrations of an unknown purgeable TPH. Low concentrations of xylenes were also detected in the sample at 9.25 feet bgs and lead was detected above the IAL in the sample collected at 2.25 feet bgs. No HBLs were exceeded. No organic compounds were detected in the samples collected at 4.25, 6.75, and 16.75 feet bgs. Analysis of groundwater sample from this well detected cadmium at 13.5  $\mu\text{g/l}$ , slightly above federal and state MCLs.

## **Building 128**

Analysis of samples from Boring PA24B002, -B004, and -MW02A, drilled along the northeast side of the building and adjacent to the fuel line (PA-46; See Section 5.2), and PA24B005, collected between

Buildings 128 and 130, detected TPH, TOG, toluene, xylenes, ethylbenzene, PCBs, and noncarcinogenic PAHs. Sodium, lead, vanadium, and antimony were the only inorganics detected above IALs. In general, concentrations of TOG, the hydrocarbons, and hydrocarbon-related compounds (Plate 27) increase with depth with maximum concentrations at or about the water table.

Aroclor-1260 exceeded the HBLc at  $10^{-6}$  for adult resident receptors in the sample collected from PA24B004 at 2.25 feet bgs. TPH-g exceeded the HBLc for adult resident and commercial worker receptors at  $10^{-6}$  in the sample at 11.25 feet. No other HBLs were exceeded.

Groundwater samples from PA24MW02A contained TPH-d and TOG above the HBLn for adult resident and adult resident and commercial worker receptors, respectively. Lead was also detected above the IAL and the federal MCL (Plate 28).

Analysis of the samples collected from PA24B003 detected TPH-d and TOG; benzene was detected at low concentrations in the deeper samples. Copper, manganese, vanadium, and zinc concentrations were above IALs.

### **Building 130**

A similar suite and distribution of contaminants is seen in the samples collected from PA24B006, -B008, and -MW03A, collected along the northeast side of Building 130 and, again, adjacent to the PA-46 fuel lines. No HBLs were exceeded.

TCE was detected above the HBLc at  $10^{-6}$  for adult resident receptors in a shallow soil sample from PA24B010, located adjacent to a sump within the building. TPH-d, TPH-g, carbon tetrachloride, and TOG were also detected.

Analytical results of the samples collected from PA24B007, an area of poor housekeeping, showed sporadic detections of PAHs, TPH-d and TOG, and magnesium above its IAL; all chemicals were below HBLs.

TPH-d was detected at a concentration above the HBLn for adult resident receptors in the groundwater sample from PA24MW03A; however, no MCLs were exceeded (Plate 28). Unknown purgeable TPH was also detected at a significant concentration ( $2,800 \mu\text{g/l}$ ) as well as unknown extractable TPH.

### **6.3.5 Discussion and Recommendations**

Building 124 is being investigated as part of adjacent Sites PA-25 and IR-6. Recommended actions will be described under those investigations.

Analytical results for soil and groundwater samples from Building 125 do not indicate a point source release and therefore no further investigation is recommended in this area.

TCE was detected at low concentrations in soil at PA24B010, adjacent to the sump in the area leased by Protective Finishes Co., in Building 130. Because the boring was located adjacent to the sump and most likely does not represent maximum concentrations associated with a release, which would have been directly beneath the sump, further investigation is recommended. As summarized in Table 16, two borings and a monitoring well are proposed to evaluate the lateral and vertical extent of the TCE and other contaminants in the soil and groundwater in this area. Locations of the proposed borings/well are shown on Plate 29.

Analysis of soil and groundwater samples indicates the presence of TPH and TOG along the northeast side of Buildings 128 and 130. The nature and distribution of these compounds indicate the source appears to be related to diesel and lube oil pipelines in this area; these pipelines comprise part of PA-46. Further investigation of this area of PA-24 is recommended and will be incorporated with subsequent work at PA-46. The work plan for this area is presented with PA-46 and can be found in Section 5.2.5.

## **6.4 PA-25 (Building 134)**

The following sections present the history and a description of PA-25 as related to potential chemical contamination, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.

### **6.4.1 Site History and Description**

PA-25 consists of Building 134 which contained offices and the Machine Shop and Q & RA (Plate 30). Historically the building contained the Cal Marine Works Machine Shop. More recently, the building housed the Odaco Refrigeration Machine Shop and Storage.



During preparation of the Work Plan in February and March 1991 and at the onset of the SI field work in January 1993, site inspections were conducted at this site. These inspections noted the following:

- A large concrete dip tank/degreasing vat labeled "chlorinated materials" built into the building foundation drains to a sump that is partially inside and partially outside the building. The tank contains sludge, and the sump contains liquid.
- Pools of standing oil were observed on the concrete floor near and under machines during the 1991 investigations. These were not observed during the 1993 inspection; the floors near and under the machines were clean with no evidence of physical damage or contamination.
- The floor tile in one machine room is saturated and deformed by apparent oil and corrosive material.
- A utility vault is located on the exterior southwest side of the building.

#### **6.4.2 Field Investigation**

The field investigation consisted of the following:

- Sampling the sludge/liquid in the dip tank and in the sump (PA25SU01 and SU06, respectively)
- Drilling soil borings and collecting soil samples adjacent to the dip tank inside of the Building (PA25B009) and adjacent to the sump outside of the building (PA25B002)
- Collecting a surface soil sample (PA25SS10) immediately beneath the stained/damaged tiled floor in the building (this sample was originally intended as a floor scrape but was changed as a result of the February 1993 field variance)
- Collecting a surface soil sample immediately beneath the floor of the utility vault located on the southwest side of the building (PA25SS04).

The borings were drilled and/or the samples collected between January 20 and February 15, 1993. Sample locations and results are shown on Plate 30.

#### **6.4.3 Summary of Results**

As discussed above, five soil samples and two sump sludge/liquid samples were collected from PA-25 and analyzed for CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-d, TPH-g, TOG, CLP metals, and pH. Validated analytical data are presented in Tables F-26 through F-29 in Appendix F and include tentatively identified compounds. Comparisons to HBLs and IALs are presented in Tables I-43 through I-47 in Appendix I. The results are discussed below.

Analysis of the samples collected from the dip tank/sump (PA25SU01 and -SU06) detected high concentrations of VOCs, SOCs, TOG, TPHs, and PCBs (Plate 30). Boring PA25B009 was drilled adjacent to the dip tank inside of Building 134 and samples collected beneath the base of the tank (4.75 feet bgs). Boring PA25B002 was drilled adjacent to the sump on the northwest side of Building 134 and samples collected at 11.25 and 16.25 feet bgs. Analysis of these soil samples detected PCE, chrysene, unknown extractable TPH, and TOG at PA25B009, and several VOCs (1,2-DCE, 1,2-DCA, TCE, PCE, chlorobenzene), TPH-d, TOG, and lead in the samples from PA25B002. Only the concentration of 1,2-DCA in the deeper sample from PA25B002 exceeded the HBL at  $10^{-6}$  for adult resident receptors. In general, the detection limits for a majority of the organic analytes were elevated and several TICs were detected by the CLP SOC analyses.

PA25SS10, collected beneath the stained and damaged tile floor, contained carcinogenic and noncarcinogenic PAHs, DDD, TPH as motor oil, and TOG. Benzo(a)anthracene and Benzo(k)fluoranthene exceed the HBLc at  $10^{-6}$  for adult resident receptors (Plate 30).

Soil beneath the utility vault along the southwest side of the building (PA25SS04) contained Aroclor-1260, unknown extractable TPH, and TOG; lead exceeded the HBLn. Concentrations of Aroclor-1260 exceed the HBLc at  $10^{-5}$  for all three receptors.

#### **6.4.4 Discussion and Recommendations**

Although the samples collected and analyzed from the borings drilled adjacent to the dip tank/sump generally showed very low concentrations of contaminants, these borings were not optimally located to detect a release (i.e., through the sump). The presence of VOCs, the high detection limits, and the presence of SOC TICs appears to indicate that a release to the environment from the dip tank/sump has occurred and that further investigation is necessary to evaluate the lateral and vertical extent of contamination. Four soil borings are recommended to investigate lateral and vertical extent of the possible release, two of which will be located in the dip tank. The details of the investigation are presented in Table 17 and the locations of the proposed borings are shown on Plate 31.

Because the soil sampled at PA25SS10 (1) showed only low levels of contaminants with HBL exceedances only at  $10^{-6}$  for adult resident receptors and (2) most likely represents the maximum concentrations associated with a release to the environment at this location, no further investigation is recommended at this location.

No further work is recommended in the stained and damaged floor tile area because the HBL exceedances are at the  $10^{-6}$  level for adult resident receptors only and there is only a small areal extent of the staining.

## **6.5 PA-26 (Building 157 and Area XIV)**

The following sections present the history and a description of PA-26 as related to potential chemical contamination, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.

### **6.5.1 Site History and Description**

PA-26 consists of Building 157, which contained the Q & RA Industrial Lab and the Metal Fabrication Branch, and Area XIV (Plate 32). Historically the building was used for the fabrication of metal products, welding, and as a nondestructive testing lab. Currently the building is not in use. Area XIV consists of Building 140 (Pumphouse), Building 141 (Dock Shipwrights Shop), and former Building 142A (Air Raid Shelter). Historically this area was used for a carpentry shop, drydock work, pumphouse and sandblasting. Area XIV, the Metal Fabrication Ranch, was originally identified in the HPA fence-to-fence survey (*ERM-West, 1988*).

The areas were inspected by HLA in February and March 1991, during preparation of the Work Plan, and at the onset of the SI investigation in January 1993. The observations during these inspections are as follows:

#### **Building 157**

The interior floor of the building is concrete at the northeast end and soil at the southwest end. A storm drain is located near the center of the soil floor where some staining was observed. A workbench area with a small fumehood is on the southeast wall. An overturned drum surrounded by stained soil and oily sludge is outside the building at the northeast corner.

#### **Area XIV**

Sandblast material was observed in several locations. Storm drains likely contain sandblast material and other sediments. A pressure cylinder and an associated UST possibly used for wood treatment

are adjacent to Building 141. Debris suspected of containing asbestos materials is present along the shoreline. In the January 1993 inspection, the water in the pumphouse chamber was observed to have a slight sheen, and, as discussed below, collection of a sample of this water was added to the SI investigation.

#### **6.5.2 Field Investigation**

The SI field investigation at Building 157 consisted of the following:

- Collecting three surface soil samples from stained areas of the floor of the Building 157 and compositing for analysis (PA26SS02)
- Collecting a surface soil sample at the stained area at the overturned drum (PA26SS01)
- Collecting a sediment sample within the storm drain (PA26SW03).

The samples were collected in January 1993; sample locations are shown on Plate 32.

The field investigation at Area XIV consisted of the following:

- Collecting storm drain sediments from two storm drains across the area (PA26SW04 and -SW05)
- Collecting sandblast material from four locations across the area and compositing for analysis (PA26SB06)
- Collecting a surface soil sample beneath the wood treatment cylinder outside Building 141 (PA26SS07)
- Collecting a surface soil sample near the suspected asbestos material (PA26AS08)
- Collecting a water sample from the pumphouse chamber in Building 140 (PA26SU09).

The samples were collected in January 1993; sample locations are shown on Plate 32.

#### **6.5.3 Summary of Results**

Three surface soil, three storm drain sediment, one sandblast, one sump sample, and one sample of suspected asbestos material from PA-26 were analyzed for CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-d, TPH-g, TOG, CLP metals, and pH. The storm drain sediment samples were also analyzed for cyanide. Sample locations and results are shown on Plate 32. Validated analytical data for PA-25 are presented in Tables F-30 through F-37 in Appendix F and include tentatively

identified compounds. HBL and IAL comparisons for all matrices are presented in Tables I-48 through I-61 (Appendix I).

### **Building 157**

Sample PA26SS01, collected at the overturned drum, contained TOG above the HBLn for adult resident receptors, the presence of TPH-d and TPH-g, and lead above its IAL (Plate 32). SOC detection limits were moderately high and many SOC TICs were noted (Table F-30).

The composite surface sample collected in Building 157 (PA26SS02) detected concentrations of carcinogenic PAHs, Aroclor-1260, unknown extractable TPH, TOG, and copper, lead, and zinc above IALs. Aroclor-1260, at 1.5 mg/kg, exceeded the HBLc at  $10^{-5}$  for adult resident and commercial worker receptors, and at  $10^{-6}$  for child resident receptors. Benzo(a)pyrene exceeded the HBLc at  $10^{-6}$  for adult resident and commercial worker receptors (Plate 32).

Analysis of the storm drain sediment sample (PA26SW03) detected carcinogenic and noncarcinogenic PAHs and metals. Aroclor-1260 was detected above the HBLc at  $10^{-6}$  for adult resident receptors; copper, lead mercury, and zinc were detected above their IALs (Plate 32).

### **Area XIV**

Analytical results for the samples collected in Area XIV are shown on Plate 32. The results of the storm drain sediment samples (PA26SW04 and -SW05) show the following:

- The presence of carcinogenic and noncarcinogenic PAHs
- The presence of unknown extractable and purgeable TPH, PCBs, pesticides, and TOG
- A concentration of Aroclor-1260 above the HBLc at  $10^{-6}$  for adult resident receptors in sample -SW04
- Concentrations of copper, lead, and zinc above the IALs; the concentration of lead in the sample from PA26SW05 exceeds the HBLn for child resident receptors.

Analysis of the sandblast composite (PA26SB06) detected carcinogenic and noncarcinogenic PAHs and metals above IALs; however, only benzo(a)pyrene was above the HBLc for adult resident and commercial worker receptors at  $10^{-6}$ .

The surface soil sample collected near the wood treatment cylinder (PA26SS07) detected concentrations of TOG, and beryllium and manganese above IALs; the manganese concentration is above the HBLn for child resident receptors (Plate 32). Concentrations of barium, copper, and zinc were also above their IALs.

The surface soil sample collected beneath the asbestos-like materials (PA26SS08) showed no detectable asbestos. The water sample from the pump chamber contained only low levels of pesticides.

#### **6.5.4 Discussion and Recommendations**

##### **Building 157**

Additional work is recommended inside Building 157 because of the poor condition of the floor (i.e., large stained areas) and the presence of contamination in the composite samples. Additional work is also recommended in the area of the overturned drum. As summarized in Table 18, four soil borings are proposed to evaluate soil conditions of the floor of Building 157, especially near the stained areas. Soil and grab groundwater sampling locations are shown on Plate 33. To evaluate and excavate the shallow contaminated soil associated with the overturned drum, an exploratory excavation is proposed (Table 18). The details of the exploratory excavation procedure are outlined in Appendix J.

##### **Area XIV**

No additional work is necessary at the pump house or for the sandblast or asbestos materials because the chemical concentrations are low and do not pose a threat to human health or the environment. In addition, the sandblast grit will be addressed as part of the Navy's ongoing grit fixation project. Details of this project will be provided under separate cover at a later date.

The analytical results at the wood treatment cylinder show the presence of high concentrations of TOG and manganese, thus indicating a potential release to the environment. An exploratory excavation is recommended in this area to evaluate and possibly remove the lateral and vertical extent of contamination (Table 18 and Plate 33).

The types and concentrations of chemicals detected in the storm drain sediments are consistent with those sampled throughout HPA. Additional work is recommended to evaluate the configuration of

the storm drains and the potential associated contamination; the proposed work is presented in Section 5.3.1.5.

## **6.6 PA-31 (Former Building 114)**

The following sections present the history and a description of PA-31 as related to potential chemical contamination, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.

### **6.6.1 Site History and Description**

PA-31 is the site of former Building 114, which was an office building. The building has been demolished and the area is used as a recreation area for archery, horseshoes, and similar activities.

The area was inspected by HLA in February and March 1991 during preparation of the Work Plan and in January 1993 at the onset of the SI field investigation. Observations during the inspections are as follows:

The building has been removed. Some evidence of the building footings remains. The area has been covered by sand that appears to be sandblast residue.

### **6.6.2 Field Investigation**

The field investigation consisted of collecting three samples of the suspected sandblast material from across the site on January 21, 1993, and compositing them for analysis (PA31SB01) (Plate 34). The sample was analyzed for CLP SOCs, CLP metals, cyanide, and pH.

### **6.6.3 Summary of Results**

Sample locations and results are shown on Plate 34. Validated analytical data for PA-31 are in Tables F-38 and F-39 in Appendix F and include tentatively identified compounds.

Analytical results show the presence of low levels of noncarcinogenic PAHs and molybdenum above its IAL (Table I-62; Appendix I). No HBLs were exceeded.

#### **6.6.4 Discussion and Recommendations**

On the basis of the analytical results, no further work is recommended at this site.

#### **6.7 PA-42 (Building 109 and Building 113)**

The following sections present the history and a description of PA-42 as related to potential chemical contamination, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.

##### **6.7.1 Site History and Description**

PA-42 consists of Building 109, which contains Harbor Sales and Leasing and Building 113, which houses Tug and Sub Maintenance, Salvage Divers, and Substation S. Historically, Building 109 was used as the police station. Building 113 was used as a machine shop, torpedo maintenance shop, offices, and an electrical substation.

The areas were inspected by HLA in February and March 1991 during preparation of the Work Plan and in January 1993 at the onset of the SI field program. Observations made during these inspections are as follows:

##### **Building 109**

The building appears to house offices. No evidence of the use of hazardous materials was observed. Previous reports indicated that an "oil/water mixture reservoir" with a capacity of approximately 100 gallons was abandoned at the site. No evidence of this reservoir was observed.

##### **Building 113**

Several grease or chemical stains were observed on the floor in the southeast corner of the building near a sink. Some solid chemical residue was also present. The floor in the stained area is pitted and damaged. Floor drains may contain oil and other residue. A partly disassembled torpedo was observed near the center of the building; however, no associated leaks or evidence of releases were observed. Several large oil-covered lathes are in the south end of the Building. Some X-ray equipment (apparently belonging to the tenants of 113A) is stored on the west side. On the



building's west exterior is a sign indicating "Radiation Area." A substation on the west side contains a power switch labelled "diesel oil," which could be associated with an UST. No UST(s) is listed in the removal or closure program. Previous reports indicated a sump at the site; however, no sumps or indications of possible sumps were observed during the site inspections.

### **6.7.2 Field Investigation**

The field investigation for Building 109 consisted of conducting a geophysical survey to assess the presence of the reservoir previously reported at the site. As shown on Plate 35, a soil boring (PA42B001) was drilled adjacent to this location to evaluate whether there was a release to the environment; soil samples were collected at 5.75 and 10.5 feet bgs (approximately adjacent to and below the bottom of the object, respectively) for analysis. The soil samples were analyzed for CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-d, TPH-g, TOG, CLP metals, and pH.

A geophysical survey was also conducted at Building 113 to assess the possible presence of an UST. A soil boring (PA42B004) was drilled and a surface sample collected (PA42SS06) at two locations where the concrete was stained and damaged (Plate 35). At PA42B004, soil samples were collected at 1.75, 6.25, and 11.25 feet bgs. The soil samples were analyzed for the constituents listed above.

### **6.7.3 Summary of Results**

Two geophysical surveys were performed and six soil samples were collected at PA-42. Sample locations and results are shown on Plate 35. Validated analytical data are presented in Tables F-40 and F-41 in Appendix F and include tentatively identified compounds. Comparisons to HBLS and IALs are presented in Tables I-63 and I-64 in Appendix I. The results are discussed below by building.

#### **Building 109**

The geophysical survey at Building 109 indicated the presence of a buried metal object on the southwest side of the building. This object was thought to be the previously reported abandoned reservoir. Analysis of the two soil samples from Boring PA42B001 detected only very low levels of TOG; no HBLs or IALs were exceeded.

### **Building 113**

Samples from PA42B004 at 1.75 and 6.25 feet bgs generally contained low levels of noncarcinogenic PAHs, TOG, PCBs and unknown extractable TPH. No organic analytes were detected in the sample collected at 11.25 feet bgs. There were no HBL or IAL exceedances.

Analysis of the surface soil sample at PA42SS06 detected only very low levels of noncarcinogenic PAHs and pesticides. No HBLs or IALs were exceeded.

### **6.7.4 Discussion and Recommendations**

### **Building 109**

Although the presence of low levels of TOG at PA42B001 do not indicate a point source release and no HBLs were exceeded, the soil samples collected may not have been sufficient to locate a release because samples were not collected below the suspected reservoir. Therefore, it is recommended that the underground object be removed and the underlying soil assessed to evaluate potential leakage of hazardous materials from the buried object. An exploratory excavation is recommended as detailed in Appendix J and Table 19, and shown on Plate 36.

### **Building 113**

The compounds detected in all of the samples collected from the Building 113 area and their relative concentrations do not indicate a point source release and no further work is recommended at the Building 109 area.

### **6.8 PA-57 (Drydock 4 Area)**

The following sections present the history and a description of PA-57 as related to potential chemical contamination, describe the field investigation and observations, summarize the results, evaluate the data, and provide recommendations.

### **6.8.1 Site History and Description**

PA-57 is the Drydock 4 area, located in Parcel C. The site was used historically for ship repair, but is not currently in use.

The area was inspected by HLA in February and March 1991 during preparation of the Work Plan and at the onset of the SI field investigations in January 1993. The observations made during these inspections are as follows:

The entire area is paved. There is evidence of dispersed sandblast material on the asphalt. An oil stain from a leaking transformer on the northeast side extends to a storm drain. ACM wrapping was observed on steam pipes associated with water tanks on each side of the drydock area. A large hopper containing black sandblast sand is present at the north corner of the site. On the west corner is an empty tentlike structure labelled "hazardous waste accumulation area." Minor oil and paint staining was observed on the pavement. No stored hazardous wastes were observed in the tentlike structure.

### **6.8.2 Field Investigation**

The field investigation at Drydock 4 consisted of the following:

- Collecting sediment samples from ten storm drain catch basins across the site (PA57SW01 through -SW07, -SW09, -SW10, and -SW12. Another storm drain sediment sample (-SW08) was planned but could not be collected because of the lack of sediment in the drain
- Collecting sandblast materials from two locations (PA57SB11 and SB13)
- Collecting surface soil samples beneath stained pavement and within the hazardous waste accumulation area (PA57SS14 and SS15).

Sampling locations are shown on Plate 37.

The sediment and surface soil samples were analyzed for CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-d, TPH-g, TOG, CLP metals, hexavalent chromium (Cr VI), and pH. The samples of sandblast materials were collected and analyzed for CLP SOCs, CLP metals, cyanide, Cr VI, and pH.

### **6.8.3 Summary of Results**

Sample locations and results are shown on Plate 37. Validated analytical data for PA-57 are presented in Tables F-42 through F-47 in Appendix F and include tentatively identified compounds. HBL and IAL comparisons are summarized in Tables I-65 through I-77 in Appendix I. The results are discussed below.

In general, the storm drain sediment samples contained metals, TOG, carcinogenic and noncarcinogenic PAHs, TPH-d, and Aroclor-1260. Several metals, (most consistently, arsenic, antimony, copper, lead, zinc, molybdenum) were detected above IALs. HBL exceedances are as follows:

- In four samples, Aroclor-1260 was detected and concentrations above the HBLc at  $10^{-6}$  for adult residents and in one of these samples for commercial workers
- Arsenic exceeded the HBLc at  $10^{-6}$  for all three receptors at every location except PA57SW06 and PA57SW09; it also exceeded the HBLc at  $10^{-5}$  for adult residents at eight locations and for commercial workers at five locations
- Zinc exceeded the HBLn at PA57SW02 for adult resident receptors
- Molybdenum exceeded the HBLn for adult resident receptors at PA56SW05 and -SW07.

Analysis of surface soil sample PA57SS14, collected beneath the stained pavement, detected TPH-d, TOG, and several metals above IALs (Plate 37). The TOG concentration exceeded the HBLn for all three receptors; arsenic exceeded the HBLc at  $10^{-5}$  for all three receptors and the HBLn for child resident receptors. PA57SS15, collected in the hazardous waste accumulation area, contained low levels of ethylbenzene and xylenes, TPH-d, TPH-g, TOG, and lead and zinc above IALs. The concentration of TOG exceeded the HBLn for all three receptors; no other HBLs were exceeded.

Several metals were detected in the sandblast materials at concentrations above IALs; however, no HBLs were exceeded.

### **6.8.4 Discussion and Recommendations**

The chemical data for the storm drain sediments at PA-57 are consistent with those across HPA. TOG, PAHs, Aroclor-1260, and metals above HBLs are routinely detected. Because these sediments pose a continued potential threat to the environment (i.e., San Francisco Bay and/or the soil beneath the storm drains), it is recommended that the storm drains be cleaned out and additional work

performed to evaluate the configuration of the storm drain system in the Drydock 4 area and any possible associated contamination. This investigation is outlined in the PA-50 discussion.

Because of the concentrations of TPH, and TOG and the HBL exceedances, exploratory excavations are recommended to evaluate and possibly remove contaminated soil associated with these areas (Plate 38). The work plan is presented in Table 20 and details of the exploratory excavation procedure are presented in Appendix J.

As stated above, the sandblast materials contained several metals above IALs; no HBLs were exceeded. Because these materials lie on top of competent asphalt, no contamination of the underlying soil is likely to have occurred and no further investigation is recommended. However, the sandblast materials will be addressed as part of the sandblast grit fixation project being undertaken by the Navy.

## **7.0 WORK PLAN SUMMARY**

Additional work proposed for the utilities, building sites, and Drydock 4 as discussed previously is summarized in Table 21. Plate 39 presents this information as well as existing SI and RI sampling locations, as requested in EPA comments to the Navy on the *Draft Parcel B Site Inspection Report* (HLA, 1994).

## **8.0 RISK ASSESSMENT SUMMARY**

This section summarizes PRC's evaluation of risk for site PA-31, for which no further investigation has been proposed, as described above in Section 6.6. PRC's report of risk evaluation is included as Appendix H.

The overall potential for significant contamination at the site was considered to be low. The primary pathways of exposure (that is, by ingestion, inhalation, and dermal contact) are removed due to the proposed removal of the sandblast waste by the Navy. No further investigation is proposed for PA-31.

For PA sites where additional investigation is required, IR sites where investigations have concluded, and sites where no further investigation is proposed (e.g., PA-31), a comprehensive risk assessment for all of Parcel B will be presented in future RI/FS reports.

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**TABLES**

**Table 1. Parcel Reference List  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

Parcel	PA Site	Volume in SI Work Plan <sup>1</sup>	Associated Buildings or Areas
A	19	III	901
	41	III	818, 816
	43	III	906
	45	I	Steam lines
	50	I	Storm drain and sanitary sewer lines
	51	III	Former PCB-containing transformer locations
B	23	III	146, 161, 162
	24	II	124, 125, 128, 130
	25	III	134
	26	III	157, Area XIV
	31	III	114
	42	III	109, 113
	45	I	Steam lines
	46	I	Fuel distribution lines: Tank Farm
	50	I	Storm drain and sanitary sewer lines
	51	III	Former PCB-containing transformer locations
C	27	III	205
	28	III	211/253, 219, 230, 231, 258, 270, 271, 281
	29	III	203, 217, 275, 279, 280, 282, Area bounded by Nimitz, Blandy and "C" Streets
	30	III	241
	45	I	Steam lines
	49	I	Fuel distribution lines: Buildings 205 and 203
	50	I	Storm drains and sanitary sewer lines
	51	III	Former PCB-containing transformer locations
	57 <sup>2</sup>	III	Drydock 4 area
	58	III	Scrap yard across from Building 258
D	32	II	Regunning Pier, 383
	33	III	302, 302A, 304, 364, 411, 418
	34	III	351, 366
	35	III	274, 306, Area bounded by Manseu, Morell, and "E" Streets
	36	II	371, 400, 404A, 405, 406, 413, 414, 704, Area west of 405
	37	III	401, 423, 435, 436
	38	III	500, 507
	39	II	505
	44	III	438, Area near Buildings 408, 409, 410
	45	I	Steam lines
	48	I	Suspected steam lines: former Building 503

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Hunters Point Annex  
San Francisco, California**

<b>Parcel</b>	<b>PA Site</b>	<b>Volume in SI Work Plan<sup>1</sup></b>	<b>Associated Buildings or Areas</b>
D (cont)	50	I	Storm drains and sanitary sewer lines
	51	III	Former PCB-containing transformer locations
	53	III	525, 530
	55	III	307
E	38	III	506, 507, 509, 510
	39	II	707
	40	III	527, Pier 2
	45	I	Steam lines
	47	I	Fuel distribution lines: Tank S-505
	50	I	Storm drains and sanitary sewer lines
	51	III	Former PCB-containing transformer locations
	52	III	Railroad right-of-way
	54	III	511A
	56	III	Area VII, Railroad tracks

Notes:

<sup>1</sup> Volume I = HLA, 1992b; Volume II = HLA, 1992a; Volume III = HLA, 1992e

<sup>2</sup> PA-57 is in Parcel C but is discussed in the Parcel B SI report.

**Table 2. Parcel B, Sites with Known or Suspected Chemical Usage or Disposal<sup>+</sup>**  
**Parcel B Site Inspection Report**  
**Hunters Point Annex**  
**San Francisco, California**

Building No.	Navy Building Activities	Tenant	Inventoried Chemical <sup>1</sup>	Large (>10 gal) Storage Containers <sup>1</sup>	Number of Aboveground Tanks <sup>1</sup>	Number of Transformers <sup>1</sup>	Sump <sup>1</sup>	Asbestos <sup>1</sup>	Leak or Spill <sup>1</sup>	Comments
109	Police Station	Harbor Leasing and Sales	Oil (PCBs)	≥ 100-gal oil/water mixture reservoir		3			Yes	Staining associated. Reservoir abandoned outside.
113	Tug Maintenance: Salvage Divers: Substation "S"		Oils (PCBs), sulfur hexafluoride	5 (55-gal) oil drums both open and closed; ≥ 175 gallons		1	Yes	Yes		Oil stains on pavement from leaking hydroequipment
113a	Q&RA Non-Destructive Test Facility									Building title suspect
114	Office Building	Smith/Emery	Corrosives, hydrocarbons, PCB oil, kerosene, X-ray developing chemicals.	3 (55-gal) kerosene reservoirs				Yes		Acid reservoirs inside next to drain, in use.
115	COMSUBGRUS-FRAN Office and Training Building	Finish work Reardon Jewelry Sonic Incision MicroKinetics	Acetylene			3		Yes		Tenants occupying building have small inventory of chemicals.
116	COMSUB Training Building	Frameworks Mokko Shop Moosewood Furniture	Dry joint compound	2 25-lb. bags				Yes		
117	COMSUB Barracks	J. Terzian/The Point						Yes		
120	Enlisted Men's Club	SF Police Athletic Club	Bicarbonate, paint, acetylene	55-Gal drums (detergent, Naptha)						
122	Substation "V" and Compressor Plant, S-03					8				Building title suspect
124	Acid Mixing Plant		Sulfuric acid, electrolyte		5					No documentation of tank removal. Building removed
125	Submarine Cafeteria	Kimberly Vinegar T. Bridenthal				2		Yes		Friable Asbestos
								Yes		Friable Asbestos
128	Shop Service and Work Control Center No. 1	Miller Pipeline Company	Oil, solvents, corrosives, hydrocarbons	2 (55-gal) oil 2 (55-gal) waste oil 2 (55-gal) residue						Contaminated runoff reported
130	Shop Service	Engel Engineering	Waste oil, hydrocarbons, paints, solvents	7 (55-gal) oil Some open				Yes		Friable asbestos Large quantities in storage.
		Protective Finishes	Paints, solvents, TCE, MEK, toluene	4 (55-gal) TCE, MEK toluene				Yes		Large quantities of chemicals
131	Substation "U", S-03					2				Building title suspect

**Table 2. Parcel B, Sites with Known or Suspected Chemical Usage or Disposal<sup>+</sup>**  
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**San Francisco, California**

Building No.	Navy Building Activities	Tenant	Inventoried Chemical <sup>1</sup>	Large (>10 gal) Storage Containers <sup>1</sup>	Number of Aboveground Tanks <sup>2</sup>	Number of Transformers <sup>3</sup>	Sump <sup>4</sup>	Asbestos <sup>1</sup>	Leak or Spill <sup>1</sup>	Comments
134	Machine Shop & Q&RA Offices, S-06, 38	Oda Refrigeration	Tertbutyl phenyl phosphate Penesolve 814, Penestrip CR, emulsifying agents oil (PCBs), solvent, hydraulic fluid	Degreasing vat 55-gal (unknown)				Yes		Old solvent vats and transformers. Unidentified chemicals, possible PCBs
		Touring Gear	Freon, solvent, oil	23 (55-gal) (unknown) 1 (55-gal) oil tank (oil)				Yes		Large quantities in storage. Friable asbestos. Tenant unavailable for inspection.
135	Substation "C", S-03					1				Building title suspect
140	Pump House - Drydock No. 3					3				Building title suspect
146	TACAN Facility, S-67		Chlorinated solvents, oil containing PCB, assorted paints, resins	1 (55-gal) oil (closed) 4 part-full (55-gal) oil; 1 (5-gal) oil (open) several (55-gal) (unknown)	2 <sup>4</sup>	3				Unknown contents of many containers. HLA observed oil staining on pavement
156	Rubber Shop S-56	Morgan Chemical	Paints, solvents hydrocarbons	5 (55-gal) lube oil 5 (55-gal) thinner 6 (55-gal) methanol			Yes	Yes	Yes	Morgan is hazardous waste handler; survey illegible in parts; some staining.
157	Q&RA Ind. Lab Non-Destructive Test/ Metal Fabrication Ranch		Oils, chlorinated solvents, undetermined liquids, orthophosphoric acid	open (500-gal) tank						Active drain; contents of open tank unknown
160	Sewage Pump Station "D", S-07									Building title suspect
181	Maintenance Service Center, S-07									Building title suspect
182	Paint Storage, S-71									Building title suspect
163	Rubber Shop Annex, S-56									Building title suspect

+ Source: Appendix A, Site Inspection Work Plan: PA Other Areas/Utilities, Volume III of III: 26 Sites (HLA, 1992).  
1 Source: ERM West, 1988, unless otherwise indicated.  
2 Source: Westec, 1984, unless otherwise indicated.  
3 Source: YEL, 1989, unless otherwise indicated.  
4 Source: HLA site visit - February 25 through 26, 1991.

**Table 3. Sampling and Inspection Locations in Parcel B  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

Site	Building Number	Descriptive Sample Location	Station Name*	Sample/ Inspection Date	Field Variance**	Comments
Utilities PA-45 Steam Lines		S end of Drydock 7	PA45ST200	4/21/93		Inspected pipe only; no sample
		N corner of Building 125	PA45ST201	4/20/93		Inspected pipe only; no sample
		NE corner of Building 130	PA45ST202	4/23/93		Inspection and sample
		SE part of PA-26	PA45ST203	5/06/93	6/06/93	Inspected pipe only; no sample
		S side of Building 134	PA45ST204	8/27/93		Inspected pipe only; no sample
		Inside Building 134	PA45ST205	8/27/93		Inspected pipe only; no sample
		N side of Building 134	PA45ST206	8/27/93		Inspected pipe only; no sample
		SE corner of Building 130	PA45ST207	8/27/93		Inspected pipe only; no sample
		NE corner of Building 130	PA45ST208	8/27/93		Inspected pipe only; no sample
		NE of Building 159	PA45ST209	8/27/93		Inspected pipe only; no sample
		SW corner of Drydock 4	PA45ST306	5/11/93	6/06/93	Sample location added
		SE corner of Drydock 4	PA45ST307	5/11/93		
		SE corner of Drydock 4	PA45TA01	6/01/93		
		SE corner of Drydock 4	PA45TA09	6/03/93		"Native soil" as well as pipe trench fill
		SE corner of Drydock 4	PA45TA18	6/21/93		Encountered poss. coal; suspect asbestos
PA-46 Fuel Lines		Geophysical survey		1/26-2/3/93		Verify pipeline alignments
		Central IR-6	PA46TA01	1/27/93		Hydrocarbons observed
		Northern IR-6	PA46TA02	1/27/93		Slight odor
		SW side of Building 134	PA46TA03	1/27/93		Sampled at 2 & 6.5 ft.
		NE side of Building 134	PA46TA04	1/28/93		Sampled at 5 & 7 ft.
		W of Building 133	PA46TA05	1/28/93		Sampled at 3.5 & 10 ft.; diesel odor at 10 ft.
		E corner of Building 130	PA46TA06	2/01/93		
		N corner of Building 130, near PA24B006	PA46TA07	2/01/93		Sampled under north & south lines in trench



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Site	Building Number	Descriptive Sample Location	Station Name*	Sample/ Inspection Date	Field Variance**	Comments
		E of Building 159	PA46TA08	2/02/93		Sampled northernmost line
		SE of Building 144	PA46TA09	2/02/93		Confirmed absence of fuel line
		N corner of Building 134	PA46TA10	2/03/93	2/03/93	T.D. at water table
		W corner of Building 134	PA46TA11	2/03/93	2/03/93	
PA-50 Storm Drain Lines		Near PA50SW208	PA50TA01	5/03/93		OVA=0 ppm
		In PA-24	PA50TA02	5/03/93		Water seeping from crack in trench wall
		S of PA-50	PA50TA06	6/17/93		Petroleum hydrocarbon observed on probes; strong smell from cuttings
		Near SE corner of Building 121	PA50TA07	6/16/93		Large crack in terra cotta pipe
		NE of Building 113, parallel to Lockwood St.	PA50CB200	1/13/93		
		SE of Building 157	PA50CB205	5/18/93		Unable to remove cover
		In PA-26, SW corner of Bldg 141	PA50CB206	1/15/93		
		S of Building 121	PA50FC211	1/13/93		Sheen on surface
		NE of Building 134	PA50FC212	1/13/93		Sheen & strong petroleum odor milky white liquid on bottom of vault
		In PA-24	PA50SW201	1/12/93		Strong sheen observed
		Near N corner of Building 123	PA50SW202	5/19/93		
		In PA-24	PA50SW203	1/12/93		Strong sheen observed on water
		E PA50TA02, SW of Building 133	PA50SW204	4/28/93		
		SW of Building 123	PA50SW207	4/28/93		
		SW of Building 123	PA50SW208	4/28/93		
		SW of Building 123	PA50SW209	4/28/93		
		W of Building 123	PA50SW210	6/15/93		
		SW of Building 121, along Lockwood St.	PA50SW213	6/15/93		

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Site	Building Number	Descriptive Sample Location	Station Name*	Sample/ Inspection Date	Field Variance**	Comments
		W of Building 146	PA50SW214	6/15/93		Sheen on water
		S of Building 115	PA50SW215	6/03/93		
		SE of Building 104	PA50SW216	6/03/93		Manhole buried by sediment
		E of Building 125	PA50SW217	6/04/93		
		SW of Building 134	PA50SW218	6/04/93		Strong sanitary sewer odor; grayish water
		SW of Building 134 along Robinson St.	PA50SW219	6/04/93		Slight odor from sanitary sewer interconnect
		W of Building 146	PA50SW220	6/15/93		
		NE of Building 144	PA50SW221	6/15/93		Filled with water
		E of Building S-146, S of Building 128	PA50SW222	6/16/93		
PA-50 Sanitary Sewers		At end of Drydock 7	PA50SN201	1/12/93		(was SW02)
		SW corner of Building 125	PA50SN206	3/16/93		
		South of PA-25	PA50SN235	3/31/93		
		SW corner of Building 125	PA50MW01A	3/16/93		
		West side of PA-26	PA50MW02A	3/31/93		
PA-51	125	Soil below former transformer site & next to sump	PA51SS01	3/12/93	3/19/93	Only sampled below concrete; auger refusal
	128/131	Soil beneath stained concrete	PA51SS02	3/02/93		
		Soil beneath stained concrete	PA51SS03	3/02/93		
	113	Soil beneath stained concrete (T)	PA51SS04	2/18/93		Dark greenish gray clayey gravel (GC); no contamination noted
	123	Soil beneath stained concrete (T)	PA51SS05	2/18/93		V. dark grayish brown poorly-graded sand with silt (SP-SM); no contamination noted
	122	Soil beneath heavily stained concrete (T)	PA51SS06	2/18/93		Dark reddish brown clayey gravel (GC); no contamination noted; 6 ft. void space between concrete slab and soil below

**Table 3. Sampling and Inspection Locations in Parcel B  
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San Francisco, California**

Site	Building Number	Descriptive Sample Location	Station Name*	Sample/ Inspection Date	Field Variance**	Comments
		Soil beneath leaking transformer (T)	PA51SS07	2/18/93		Dark greenish gray clayey gravel (GC); no contamination noted; 8.5 ft. void space between concrete slab and soil below
<b>Building Sites</b>						
PA-23	146	AST contents	PA23TK01	1/19/93		TD-12.6 ft., 1 inch of product in tank, yellow product appears to be solvent or hydrocarbon; info to NSTI
		AST contents	PA23TK02	1/19/93		TD-9.5 ft., 2.1 ft of product in tank, product is amber color, thick, poss. hydrocarbon; info to NSTI
		Storm drain beneath dispensing hoses	PA23SW03	--	3/31/93	No sediment to collect
		Soil beneath paint/resin at south exterior corner	PA23SS04	1/19/93		
		Soil beneath oil stains on north side	PA23SS05	1/19/93		
		Sample beneath asph. and AST dispensing hoses	PA23SS07	2/17/93		Dark red brown clayey gravel with sand (GC)
	161	Remove floor plates and collect samples		--	3/31/93	Lifted plates; no sediment to collect
		Composite 3 surface soil samples	PA23SS06	1/20/93		3 samples sent to lab to make 1 composite
PA-24	125	W of building	PA24B001	1/21/93		
		SW of fenced transformer storage area	PA24MW01A	1/25/93		
	128	Adjacent to building beneath asphalt	PA24B002	1/20/93		
		South side of building beneath asphalt	PA24B003	1/19/93		
		Adjacent to building beneath asphalt	PA24B004	1/20/93		
		Between Bldgs. 128 and 130 beneath asphalt	PA24B005	1/21/93		
		Adjacent to building beneath asphalt	PA24MW02A	1/22/93		
	130	Adjacent to building beneath asphalt	PA24B006	1/20/93		Product sheen at 9 ft.

**Table 3. Sampling and Inspection Locations in Parcel B**  
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Site	Building Number	Descriptive Sample Location	Station Name*	Sample/ Inspection Date	Field Variance**	Comments
		South of building beneath asphalt	PA24B007	1/21/93		
		Adjacent to building beneath asphalt	PA24B008	1/22/93		
		Inside building	PA24B009	1/19/93		
		Adjacent to grate over waste trench	PA24B010	1/21/93		
		Adjacent to building beneath asphalt	PA24MW03A	1/25/93		
PA-25	134	Outside Sump #1	PA25SU01	1/22/93		Sampled product & water, 0.41 ft of product
		Soil beneath Sump #1	PA25B002	1/26/93		Product-stained soil at 16 ft., 2 refusals
		Outside Sump #2	PA25SU03	--		Information to NSTI
		Soil beneath Sump #2	PA25SS04	1/21/93		OVA=0 ppm, dark brown sandy silt w/ gravel
		Composite of 4 55-gallon drums	PA25DM05	1/25/93		Collected a total of 4 samples from 5 drums, 2 drums were composited; info to NSTI
		Dip tank/degreasing vat	PA25SU06	1/25/93		2/3 full; clear yellowish liquid, solvent odor; Also sampled sump next to vat (X862)
		Stained tile	PA25FS07	--	2/23/93	Change to soil sample PA25SS10
		Machine Shop oil composite	PA25FS08	1/25/93		Product saturated sand mixed with drill press cuttings; info to NSTI
		Soil adjacent to dip tank	PA25B009	2/10/93		TD-5 ft.; no contamination noted
		Sample beneath concrete near stained tile	PA25SS10	2/18/93	2/23/93	Dark yellowish brown sandy lean clay (CL); no contamination noted
PA-26	157	Soil stain at overturned drum	PA26SS01	1/26/93		Dark brown clayey sand with gravel, no odor
		Composite of oil stains on floor	PA26SS02	1/20/93		
		Storm drain sediment	PA26SW03	1/20/93		OVA=0 ppm
	Area XIV	Storm drain	PA26SW04	1/20/93		OVA=0 ppm
		Storm drain	PA26SW05	1/20/93		Sediment is black, hydrocarbon sheen, odor

**Table 3. Sampling and Inspection Locations in Parcel B**  
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**Hunters Point Annex**  
**San Francisco, California**

Site	Building Number	Descriptive Sample Location	Station Name*	Sample/ Inspection Date	Field Variance**	Comments
						OVA=0 ppm, light sheen on water
		Sandblast material composite	PA26SB06	1/20/93		
		Surface soil under wood treatment cylinder	PA26SS07	1/21/93		
		Soil near suspected asbestos material	PA26AS08	1/20/93		Sample collected under pile of asbestos-like material
	140	Water in pump chamber	PA26SU09	2/17/93	2/23/93	Sample added
PA-31	114	Sandblast material composite	PA31SB01	1/21/93		No paint chips seen in sample
PA-42	109	Soil beneath reservoir	PA42B001	2/10/93		TD=11 ft.; no contamination noted
		Geophysical survey		2/05/93		4'x5' area (NW corner) near reworked asphalt; contains possible metal objects
	113	At pitted chemical stained area next to sink	PA42FS02	--	2/23/93	Change to soil sample PA42SS06
		Grease stain area	PA42FS03	--	2/23/93	Concrete intact; not sampled
		Soil boring at crack in concrete	PA42B004	2/10/93		TD=11.5ft; no contamination noted
		Contents of floor drains: composite	PA42FD05	--	3/31/93	No sediment to collect
		Soil under concrete near pitted area by sink (FS02)	PA42SS06	2/18/93		Light olive brown clayey gravel with sand (SC); no contamination noted
		Geophysical survey		2/05/93		No evidence of UST
PA-57	Drydock 4	Storm drain	PA57SW01	1/15/93		OVA=0 ppm
		Storm drain	PA57SW02	1/14/93		OVA=0 ppm
		Storm drain near transformer	PA57SW03	1/14/93		OVA=0 ppm; dark grayish-black sediment
		Storm drain near transformer	PA57SW04	1/14/93		OVA=0 ppm; paint chips in sediment
		Storm drain near sand hopper	PA57SW05	1/14/93		OVA=0 ppm; black sediment
		Storm drain	PA57SW06	1/14/93		OVA=0 ppm; black sediment; strong sheen

**Table 3. Sampling and Inspection Locations in Parcel B  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

Site	Building Number	Descriptive Sample Location	Station Name*	Sample/ Inspection Date	Field Variance**	Comments
						present
		Storm drain	PA57SW07	1/14/93		OVA=0 ppm
		Storm drain	PA57SW08	--		No sediment to collect
		Storm drain	PA57SW09	1/15/93		OVA=0 ppm; black sediment
		Storm drain	PA57SW10	1/14/93		OVA=0 ppm
		Sandblast material in hopper	PA57SB11	1/15/93		Black, glassy poorly-graded medium-grained sand
		Storm drain	PA57SW12	1/14/93		OVA=0 ppm
		Sandblast debris near "Hazardous Waste Accumulation Area"	PA57SB13	1/15/93		Paint chips in sand
		Oil and paint stains	PA57SS14	1/15/93		Black, tar-like
		Soil under asphalt in "Hazardous Waste Accumulation Area"	PA57SS15	3/08/93	2/23/93	Dark brown poorly-graded sand (SP); no contamination noted; sample added

**Table 3. Sampling and Inspection Locations in Parcel B  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

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**Explanation**

\* Station Names: AS = Asbestos Sample  
B = Boring  
CB = Catch Basin  
DM = Drum Sample  
FC = Flood Control Gate  
FD = Floor Drain  
FS = Floor Scrape  
MW = Monitoring Well  
SB = Sand Blast Material  
SN = Sanitary Sewer  
SS = Surface Soil Sample  
SU = Sump Sample  
SW = Storm Drain Sediment  
TA = Test Pit Area  
TK = Tank

\*\* Field Variances are included in Appendix A.

NA = Not applicable

T = Transformer location not correlated to list in Work Plan (HLA, 1992e)

**Table 4. Summary of Sample Analyses**  
**Parcel B Site Inspection Report**  
**Hunters Point Annex**  
**San Francisco, California**

**Harding Lawson Associates**

PA Site	Sampling Location	Matrix	Sample Number	Analyses												
				CLP VOC	CLP SOC	CLP Pest /PCBs	CLP Metals	CLP Cyanide	Cr VI	TPH Gas	TPH Diesel	TOG	TRPH	pH	Asbestos	Other
PA23	PA23SS04	SOIL	9303X841	X	X	X	X			X	X	X		X		
	PA23SS05	SOIL	9303X840	X	X	X	X			X	X	X		X		
	PA23SS06	SOIL	9303X842	X	X	X	X			X	X	X		X		
	PA23SS07	SOIL	9307A601	X	X	X	X			X	X	X				
	PA23TK01	OIL	9303X839	X	X	X	X			X	X	X				
	PA23TK02	OIL	9303X838	X	X	X	X			X	X	X				
PA24	PA24B001	SOIL	9303N060	X	X	X	X	X	X	X	X	X		X	X	
	PA24B001	SOIL	9303N061	X	X	X	X	X	X	X	X	X		X	X	
	PA24B001	SOIL	9303N062	X	X	X	X	X	X	X	X	X		X	X	
	PA24B001	SOIL	9303N063	X	X	X	X	X	X	X	X	X		X	X	
	PA24B001	SOIL	9303N064	X	X	X	X	X	X	X	X	X		X	X	
	PA24B002	SOIL	9303N045	X	X	X	X	X	X	X	X	X		X	X	
	PA24B002	SOIL	9303N046	X	X	X	X	X	X	X	X	X		X	X	
	PA24B002	SOIL	9303N047	X	X	X	X	X		X	X	X		X		
	PA24B002	SOIL	9303N048	X	X	X	X	X	X	X	X	X		X	X	
	PA24B003	SOIL	9303N036	X	X	X	X	X	X	X	X	X		X	X	
	PA24B003	SOIL	9303N037		X	X	X	X		X	X			X		
	PA24B003	SOIL	9303N038	X	X	X	X	X	X	X	X	X		X	X	
	PA24B003	SOIL	9303N039	X	X	X	X	X		X	X	X		X		
	PA24B003	SOIL	9303N040	X	X	X	X	X	X	X	X	X		X	X	
	PA24B003	SOIL	9303N042	X	X	X	X	X	X	X	X	X		X	X	
	PA24B003	SOIL	9303N044	X	X	X	X	X	X	X	X	X		X	X	
	PA24B004	SOIL	9303N049	X	X	X	X	X	X	X	X	X		X	X	
	PA24B004	SOIL	9303N050	X	X	X	X	X	X	X	X	X		X	X	
	PA24B004	SOIL	9303N051	X	X	X	X	X		X	X	X		X		
	PA24B004	SOIL	9303N052	X	X	X	X	X	X	X	X	X		X	X	
	PA24B004	SOIL	9303N053	X	X	X	X	X	X	X	X	X		X	X	
	PA24B005	SOIL	9303N056	X	X	X	X	X	X	X	X	X		X	X	
	PA24B005	SOIL	9303N057	X	X	X	X	X	X	X	X	X		X	X	



**Table 4. Summary of Sample Analyses**  
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Harding Lawson Associates

PA Site	Sampling Location	Matrix	Sample Number	Analyses												
				CLP VOC	CLP SOC	CLP Pest /PCBs	CLP Metals	CLP Cyanide	Cr VI	TPH Gas	TPH Diesel	TOG	TRPH	pH	Asbestos	Other
	PA24B005	SOIL	9303N058	X	X	X	X	X	X	X	X	X		X	X	
	PA24B005	SOIL	9303N059	X	X	X	X	X	X	X	X	X		X	X	
	PA24B006	SOIL	9303N054	X	X	X	X	X	X	X	X	X		X	X	
	PA24B006	SOIL	9303N055	X	X	X	X	X	X	X	X	X		X	X	
	PA24B007	SOIL	9303N065	X	X	X	X	X		X	X	X		X	X	
	PA24B007	SOIL	9303N066	X	X	X	X	X	X	X	X	X		X	X	
	PA24B007	SOIL	9303N067	X	X	X	X	X	X	X	X	X		X	X	
	PA24B007	SOIL	9303N068	X	X	X	X	X	X	X	X	X		X	X	
	PA24B007	SOIL	9303N069	X	X	X	X	X	X	X	X	X		X	X	
	PA24B008	SOIL	9303N070	X	X	X	X	X	X	X	X	X		X	X	
	PA24B008	SOIL	9303N071	X	X	X	X	X	X	X	X	X		X	X	
	PA24B008	SOIL	9303N072	X	X	X	X	X	X	X	X	X		X	X	
	PA24B008	SOIL	9303N073	X	X	X	X	X		X	X	X		X		
	PA24B008	SOIL	9303N074	X	X	X	X	X	X	X	X	X		X	X	
	PA24B009	SOIL	9303H387	X	X	X	X	X		X	X	X		X	X	
	PA24B009	SOIL	9303H388	X	X	X	X	X		X	X	X		X	X	
	PA24B010	SOIL	9303H390	X	X	X	X	X	X	X	X	X		X	X	
	PA24B010	SOIL	9303H391	X	X	X	X	X	X	X	X	X		X	X	
	PA24B010	SOIL	9303H392	X	X	X	X	X	X	X	X	X		X	X	
	PA24MW01A	SOIL	9304A464	X	X	X	X	X	X	X	X	X		X	X	
	PA24MW01A	SOIL	9304A465	X	X	X	X	X	X	X	X	X		X	X	
	PA24MW01A	SOIL	9304A466	X	X	X	X	X	X	X	X	X		X	X	
	PA24MW01A	SOIL	9304A467	X	X	X	X	X	X	X	X			X		
	PA24MW01A	SOIL	9304A468	X	X	X	X	X	X	X	X	X		X		
	PA24MW01A	SOIL	9304A469	X	X	X	X	X	X	X	X			X		
	PA24MW01A	H2O	9304H393	X	X	X	X	X	X	X	X	X				
	PA24MW02A	SOIL	9303N075	X	X	X	X	X	X	X	X	X		X	X	
	PA24MW02A	SOIL	9303N076	X	X	X	X	X	X	X	X	X		X	X	
	PA24MW02A	SOIL	9303N077	X	X	X	X	X	X	X	X	X		X	X	
	PA24MW02A	SOIL	9303N078	X	X	X	X	X	X	X	X	X		X	X	

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PA Site	Sampling Location	Matrix	Sample Number	Analyses												
				CLP VOC	CLP SOC	CLP Pest /PCBs	CLP Metals	CLP Cyanide	Cr VI	TPH Gas	TPH Diesel	TOG	TRPH	pH	Asbestos	Other
	PA24MW02A	SOIL	9303N079	X	X	X	X	X	X	X	X	X		X	X	
	PA24MW02A	H2O	9305A491	X	X	X	X	X	X	X	X	X				
	PA24MW02A	H2O	9305A492	X	X	X	X	X	X	X	X	X				
	PA24MW03A	SOIL	9304A470	X	X	X	X	X	X	X	X		X	X		
	PA24MW03A	SOIL	9304A471	X	X	X	X	X	X	X	X		X	X		
	PA24MW03A	SOIL	9304A472	X	X	X	X	X	X	X	X	X		X	X	
	PA24MW03A	SOIL	9304A473	X	X	X	X	X	X	X	X	X		X		
	PA24MW03A	SOIL	9304A474	X	X	X	X	X	X	X	X	X		X		
	PA24MW03A	SOIL	9304A475	X	X	X	X	X	X	X	X	X		X		
	PA24MW03A	H2O	9305J236	X	X	X	X	X	X	X	X	X		X		
PA25	PA25B002	SOIL	9304N075	X	X	X	X		X	X	X	X		X		
	PA25B002	SOIL	9304N076	X	X	X	X			X	X	X		X		
	PA25B009	SOIL	9306H401	X	X	X	X			X	X	X		X		
	PA25DM05	OH2O	9304X857	X	X	X	X			X	X	X				
	PA25DM05	SLDG	9304X858	X	X	X	X			X	X	X		X		
	PA25DM05	OIL	9304X859	X	X	X	X			X	X	X				
	PA25DM05	SOIL	9304X860	X	X	X	X			X	X	X		X		
	PA25FS08	SLDG	9304X863	X	X	X	X			X	X	X		X		
	PA25SS04	SOIL	9303X851	X	X	X	X			X	X	X		X		
	PA25SS10	SOIL	9307A608	X	X	X	X			X	X	X				
	PA25SU01	OIL	9303X854	X	X	X	X			X	X	X				
	PA25SU01	OH2O	9303X855	X	X	X	X			X	X	X				
	PA25SU06	OIL	9304X861	X	X	X	X			X	X	X				
	PA25SU06	OSD	9304X862	X	X	X	X		X	X	X	X		X		
PA26	PA26AS08	SOIL	9303X848												X	
	PA26SB06	SOIL	9303X847		X		X	X						X		
	PA26SS01	SOIL	9304X866	X	X	X	X		X	X	X	X		X		
	PA26SS02	SOIL	9303X843	X	X	X	X			X	X	X		X		

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PA Site	Sampling Location	Matrix	Sample Number	Analyses												
				CLP VOC	CLP SOC	CLP Pest /PCBs	CLP Metals	CLP Cyanide	Cr VI	TPH Gas	TPH Diesel	TOG	TRPH	pH	Asbestos	Other
	PA26SS07	SOIL	9303X849	X	X	X	X			X	X	X		X		PCP
	PA26SU09	OH2O	9307A600	X	X	X	X			X	X	X				
	PA26SW03	DSED	9303X844	X	X	X	X	X		X	X	X		X		
	PA26SW04	DSED	9303X845	X	X	X	X	X		X	X	X		X		
	PA26SW05	DSED	9303X846	X	X	X	X	X		X	X	X		X		
PA31	PA31SB01	SOIL	9303X850		X		X	X						X		
PA42	PA42B001	SOIL	9306H405	X	X	X	X			X	X	X		X		
	PA42B001	SOIL	9306H406	X	X	X	X			X	X	X		X		
	PA42B004	SOIL	9306H402	X	X	X	X			X	X	X		X		
	PA42B004	SOIL	9306H403	X	X	X	X			X	X	X		X		
	PA42B004	SOIL	9306H404	X	X	X	X			X	X	X		X		
	PA42SS06	SOIL	9307A602	X	X	X	X			X	X	X				
PA45	PA45ST202	OH2O	9316H425	X	X	X	X			X	X		X	X	X	
	PA45ST202	OH2O	9316H426	X	X	X	X			X	X		X	X	X	
	PA45ST306	OH2O	9319H431	X	X	X	X			X	X	X		X	X	
	PA45ST306	OH2O	9319H432	X	X	X	X			X	X	X		X	X	
	PA45ST307	OH2O	9319H433	X	X	X	X			X	X	X		X	X	
	PA45ST307	OIL	9319H434	X	X	X	X			X	X	X		X		
	PA45TA01	SOIL	9322P220	X	X	X	X			X	X			X	X	
	PA45TA09	SOIL	9322P225	X	X	X	X			X	X		X	X	X	
PA46	PA46TA01	SOIL	9304D014	X	X	X	X			X	X		X	X		
	PA46TA02	SOIL	9304D015	X	X	X	X			X	X		X	X		
	PA46TA03	SOIL	9304D016	X	X	X	X			X	X		X	X		
	PA46TA03	SOIL	9304D017	X	X	X	X			X	X		X	X		
	PA46TA04	SOIL	9304D018	X	X	X	X			X	X		X	X		
	PA46TA04	SOIL	9304D019	X	X	X	X			X	X		X	X		

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Harding Lawson Associates

PA Site	Sampling Location	Matrix	Sample Number	Analyses												
				CLP VOC	CLP SOC	CLP Pest /PCBs	CLP Metals	CLP Cyanide	Cr VI	TPH Gas	TPH Diesel	TOG	TRPH	pH	Asbestos	Other
	PA46TA05	SOIL	9304D020	X	X	X	X			X	X		X	X		
	PA46TA05	SOIL	9304D021	X	X	X	X			X	X		X	X		
	PA46TA06	SOIL	9305H395	X	X	X	X			X	X		X	X		
	PA46TA06	SOIL	9305H396	X	X	X	X			X	X		X	X		
	PA46TA07	SOIL	9305H397	X	X	X	X			X	X		X	X		
	PA46TA07	SOIL	9305H398	X	X	X	X			X	X		X	X		
	PA46TA08	SOIL	9305H399	X	X	X	X			X	X		X	X		
	PA46TA09	SOIL	9305H400	X	X	X	X			X	X		X	X		
	PA46TA10	SOIL	9305D022	X	X	X	X			X	X		X	X		
	PA46TA11	SOIL	9305D023	X	X	X	X			X	X		X	X		
PA50	PA50CB200	H2O	9302A463	X	X	X	X	X	X	X	X		X	X		
	PA50CB206	DSED	9302X825	X	X	X	X	X	X	X	X		X	X		
	PA50FC211	DSED	9302A462	X	X	X	X	X	X	X	X		X	X		
	PA50FC212	DSED	9302A461	X	X	X	X	X	X	X	X		X	X		
	IR06MW34A	DSED	9313J412	X	X	X	X	X	X	X	X		X			FC
	PA50MW01A	H2O	9311J400	X	X	X	X	X	X	X	X		X			FC
	PA50MW01A	H2O	9311J401	X	X	X	X	X	X	X	X		X			FC
	PA50MW01A	H2O	9331X009													FC EPA 9131
	PA50MW02A	H2O	9313J410	X	X	X	X	X	X	X	X		X			FC
	PA50MW02A	H2O	9313J411	X	X	X	X	X	X	X	X		X			FC
	PA50SN201	OSD	9302X805	X	X	X	X	X	X	X	X		X	X		
	PA50SN206	OH2O	9311J402	X	X	X	X	X	X	X	X		X			FC
	PA50SN206	OH2O	9331X010													FC EPA 9131
	PA50SN206	OH2O	9331X011													FC EPA 9131
	PA50SN236	OH2O	9313J413	X	X	X	X	X	X	X	X		X			FC
	PA50SW201	DSED	9302X806	X	X	X	X	X	X	X	X		X	X		
	PA50SW203	DSED	9302X808		X		X									
	PA50TA01	SOIL	9318G712	X	X	X	X	X	X	X	X		X	X		
	PA50TA02	SOIL	9318G713	X	X	X	X	X	X	X	X		X	X		

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**San Francisco, California**

Harding Lawson Associates

PA Site	Sampling Location	Matrix	Sample Number	Analyses												
				CLP VOC	CLP SOC	CLP Pest /PCBs	CLP Metals	CLP Cyanide	Cr VI	TPH Gas	TPH Diesel	TOG	TRPH	pH	Asbestos	Other
	PA50TA06	SOIL	9324A055	X	X	X	X	X	X	X	X		X	X		FC
	PA50TA07	SOIL	9324A030	X	X	X	X	X	X	X	X		X	X		
PA51	PA51SS01	SOIL	9310N155			X										
	PA51SS02	SOIL	9309A645			X										
	PA51SS03	SOIL	9309A646			X										
	PA51SS04	SOIL	9307A603			X										
	PA51SS05	SOIL	9307A604			X										
	PA51SS06	SOIL	9307A606			X										
	PA51SS07	SOIL	9307A607			X										
PA57	PA57SB11	OSD	9302X820		X		X	X						X		
	PA57SB13	OSD	9302X821		X		X	X						X		
	PA57SS14	SOIL	9302X822	X	X	X	X	X	X	X	X	X				TPH (Motor Oil)
	PA57SS15	SOIL	9310J363	X	X	X	X			X	X	X				
	PA57SW01	DSED	9302X819	X	X	X	X	X	X	X	X	X		X		TPH (Motor Oil)
	PA57SW02	DSED	9302X817	X	X	X	X	X	X	X	X	X		X		
	PA57SW03	DSED	9302X815	X	X	X	X	X	X	X	X	X		X		
	PA57SW04	DSED	9302X816	X	X	X	X	X	X	X	X	X		X		
	PA57SW05	DSED	9302X814	X	X	X	X	X	X	X	X	X		X		
	PA57SW06	DSED	9302X813	X	X	X	X	X	X	X	X	X		X		
	PA57SW07	DSED	9302X810	X	X	X	X	X	X	X	X	X		X		
	PA57SW09	DSED	9302X818	X	X	X	X	X	X	X	X	X		X		TPH (Motor Oil)
	PA57SW10	DSED	9302X811	X	X	X	X	X	X	X	X	X		X		
	PA57SW12	DSED	9302X812	X	X	X	X	X	X	X	X	X		X		

CLP - Contract Laboratory Program

CrVI - Hexavalent Chromium

FC - Fecal Coliform

PCB - Polychlorinated Biphenyls

SOC - Semivolatile Organic Compounds

TOG - Total Oil and Grease

TPH - Total Petroleum Hydrocarbons

TRPH - Total Recoverable Petroleum Hydrocarbons

VOC - Volatile Organic Compounds

**Table 5. Summary of Access Point Observations, PA-45, Steam Lines**  
**Parcel B Site Inspection Report**  
**Hunters Point Annex**  
**San Francisco, California**

Station Number	Approximate Location	Steamline Pipe Sizes and Valving	Asbestos Insulation Condition	Visible Vault Contamination	Liquid in Lines	Visible Oil Staining in Lines	Other Observations	Pipe Liquid Samples
<b>Parcel B</b>								
PA45ST200	West edge of steam system near south end of Drydock 7	6" S w/V	No insulation visible	No	No	No	Pipe interiors dry. No visible oil contamination in trench vault or inside steam lines.	N/A
PA45ST201	Near northwest side of Bldg. 125	(2) 6" S 3" C	Recent duct tape on insulation; fabric shroud, crumbling	No	No	No	Pipe interiors dry. No visible oil contamination in trench vault or inside steam lines.	N/A
PA45ST202	Northeast edge of Bldg. 130	6" S w/V 4" P w/V 3" C	Aluminum shroud, crumbling	No	Yes	No	Water in steam and pump return lines.	#9316H425 (6" S, water) #9316H426 (4" P, water)
PA45ST203	North side of Drydock 3 near Bldg. 206	6" S w/V		No	No	No	Pipe interiors dry. No visible oil contamination in trench vault or inside steamlines.	N/A
<b>Drydock 4</b>								
PA45ST306	Northeast side of Morell St. across from Bldg. 304	Intersection with 8" S 3" C	Unable to inspect vault	No	Yes	Maybe	Water in condensate line. Some dark staining; pump return line.	#9319H431 (3"C, water) #9319H432 (dupl.)
PA45ST307	Near intersection of Morell St. and "E" St.	Intersection with 8" S w/E 6" S w/V 3" C w/E	Unable to inspect vault	Yes	Yes	Yes	Oil staining in vault. Oil floating on water in condensate line. Oil in steam line.	#9319H433 (3"C, oil/water) #9319H434 (8" S, oil)
PA45ST311	Manhole lid adjacent to PA45ST307	N/A	N/A	Yes	N/A	N/A	Visual vault inspection only. Utilidor at PA45ST307 drains into manhole through hole at bottom of utilidor wall. Free product and staining present. Standing water in manhole at approx. 5 ft. below ground surface.	N/A
N/A	Not available.	P	Pump return line.					
S	Steamline.	E	Expansion joint.					
C	Condensate return line.	V	Valve.					

**Table 6. Proposed Work Plan, PA-45, Steam Lines  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

Location	Rationale/Activity	Station Designation	Type (Number)	Total Depth (feet bgs)	Sampling Interval (feet bgs)	Estimated # of Samples/ Type	Lab Analyses
<b>PARCEL B</b>	Remove accessible friable	NA	NA	NA	NA	NA	NA
	Remove remaining fluids in lines	NA	NA	NA	NA	NA	NA
<b>DRYDOCK 4</b>	Evaluate accessibility/ configuration of steamlines/ utilidors along the south wall of Drydock 4	NA	NA	NA	NA	NA	NA
	Evaluate extent of oil in lines/utilidors	NA	NA	NA	NA	NA	NA
	Remove appropriate sections of lines/utilidors and evaluate extent of contaminants adjacent to utilidors (i)	B ___-B ___	Borings (TBD) (i)	20 (ii)	0, 5, 10, 15, 20	TBD /s	All
<b>Estimated Total</b>						<b>TBD /s</b>	

- All Laboratory analyses include CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-D/-G, TRPH, CLP metals, and pH.
- bgs Below ground surface.
- NA Not applicable.
- TBD To be determined.
- (i) Assumes approximately 400 ft. of utilidor removed and borings drilled at 50 ft. intervals. Actual spacing and locations will be based on results of field investigation. A location map will be prepared and relayed to agencies using field variance protocol.
- (ii) Borings to reach bedrock or bay mud.
- /s Soil sample.

**Table 7. Proposed Work Plan, PA-46, Fuel Lines  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

Harding Lawson Associates

Location	Rationale/Activity	Station Designation	Type (Number)	Total Depth (feet bgs)	Sampling Interval (feet bgs)	Estimated # of Samples/ Type	Lab Analyses
NEW FUEL LINES	Remove remaining fuel in lines	NA	NA	NA	NA	NA	NA
	Remove lines and associated soils (i)	NA	NA	NA	NA	NA	NA
OLD FUEL LINES	Evaluate configuration of old	NA	NA	NA	NA	NA	NA
	Remove remaining fluids in lines (if present)	NA	NA	NA	NA	NA	NA
	Remove lines and associated soils (i)	NA	NA	NA	NA	NA	NA
FURTHER INVESTIGATION	Evaluate extent of TPH contamination	B013-B027 (ii)	Borings (15) & Hydropunch (22)	20	0, 5, 10, 15, 20	75 /s 22 /w	All
		MW__-MW__	Wells (TBD)(iii)	TBD	NA	TBD	All
Estimated Total						75 /s 22 /w	

All Laboratory analyses include CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-D/-G, TRPH, CLP metals, and pH.

bgs Below ground surface.

NA Not applicable.

TBD To be determined.

(i) Assumes approximately 8700 linear feet of new and old fuel lines to be removed.

(ii) 7 of the 15 Hydropunch sampling locations will have shallow and deep groundwater samples taken.

(iii) Locations of monitoring wells will be determined after evaluation of the Hydropunch analytical data; locations will be relayed to agencies using field variance protocol. Three rounds of groundwater samples will be collected from each well.

/s Soil sample.

/w Water sample.



**Table 8. Summary of Access Point Observations, PA-50, Storm Drains  
Parcel B Site Investigation Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

Location	Invert Cover	Invert Construction	Invert Condition	Invert Depth (ft. bgs)	OVA/ Gastech (ppm)	Other Observations
<b>Parcel B</b>						
PA50CB200	grate	precast	good	5.0	NM	Abundant sediment.
PA50SW201	solid	precast	good	15.3	NM	
PA50SW202	solid	precast	good	5.5	NM	Loose bricks on bottom.
PA50SW203	solid	precast	fair	11.9	NM	
PA50SW204	grate	precast	poor	9.0	NM	Some crumbling and deterioration, rusted rungs.
PA50CB205	grate	precast	N/O	2.0	NM	Unable to remove cover. One pipe observed through grate.
PA50CB206	square grate	precast	good	1.6	NM	
PA50SW207	solid	precast	good	6.9	NM	
PA50SW208	solid	precast	good	7.4	NM	
PA50SW209	solid	precast	good	8.0	NM	Rungs rusted, casing slightly cracked.
PA50SW210	solid	brick	good	6.0	NM	
PA50FC211	solid square	precast	good	8.6	NM	
PA50FC212	solid square	precast	N/O	8.8	NM	Milky white liquid on bottom of vault, unable to tell status of valve.
PA50SW214	solid	brick	good	10.0	0	Sheen on water.
PA50SW215	solid	brick	good	6.0	0	
PA50SW216	solid	brick	good	16.5	0	
PA50SW217	solid	brick	good	8.8	0	
PA50SW218	solid	brick	good	5.0	4	Strong sanitary sewer odor, grayish water.
PA50SW219	solid	brick	good	11.5	0.4	Slight sanitary sewer odor.
PA50SW220	solid	brick	good	10.5	0	
PA50SW222	grate	brick	good	3.9	NM	Abundant sediment.

N/O = Not observed

NM = Not measured

**Table 9. Summary of Video Surveys, PA-50, Storm Drains**  
**Parcel B Site Inspection Report**  
**Hunters Point Annex**  
**San Francisco, California**

**Harding Lawson Associates**

Length*	Storm Drain Segment		Pipe Diameter (inches)	Date	Observations at:
	Invert Depth (feet bgs)	Invert Depth (feet bgs)			
B1	PA50SW111 (11.5)	to PA50SW215 (6)	24"	6/3/93	54 ft. crack on top of pipe 55 ft. entering PA50SW216 61.1 ft. in middle of PA50SW216 66 ft. pipe joint offset 105 ft. roots entering through joint 108 ft. roots entering through joint 117 ft. pipe joint offset, top of joint offset, roots entering through joint 129.5 ft. roots entering through joint 147 ft. roots entering through joint 162 ft. pipe joint offset, top of pipe broken, offset pieces of pipe 174 ft. pipe joint offset, bottom of pipe broken and cracked 175 ft. top of pipe broken, pieces missing 179 ft. pipe offset at bottom, cracked at top 182 ft. badly cracked pipe 184.2 ft. unknown manhole, not visible on ground surface 241 ft. standing water in pipe 254 ft. total distance of video log
B2	PA50SW215 (6)	to PA50SW209 (8)	30"	6/4/93	7 ft. pipe repaired with brick work 36 ft. cracked joint on top of pipe 41 ft. crack on top of pipe 57 ft. top of pipe broken, appears to have been punched in from outside 64 ft. high tide mark 1/2 way up side of pipe 65 ft. break-in connection on north side of pipe 94 ft. break-in connections on both sides of pipe, cracked joint 100 ft. high tide mark 3/4 way up side of pipe break-in connection on south, wood and brick plug 156 ft. in connection 189 ft. break-in connection on north 190 ft. high tide mark at top of pipe 207 ft. break-in connection on south 237 ft. break-in connection on north 261 ft. pipe 10% filled with sed 272 ft. offset joint 282.6 ft. total distance of video log
B3	PA50SW207 (6.9)	to PA50SW208 (7.4)	and		no distance counter was recorded on the video tape - each section is 4 ft. long; video in black and white
	PA50SW208 (7.4)	to PA50SW209 (8)	30"	4/26/93	joint #11 root in joint section 16 break-in connection section 17 top of pipe broken and missing section 17 crack in side of pipe (left) section 26 crack in side of pipe (left); silt 15 % in pipe section 40 break-in connection top section 41 manhole 166 ft. total distance of video log

**Table 9. Summary of Video Surveys, PA-50, Storm Drains  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

Length*	Storm Drain Segment		Pipe Diameter (inches)	Date	Observations at:
	Invert Depth (feet bgs)	Invert Depth (feet bgs)			
B4	PA50SW202 (5.5)	to PA50SW217 (8.8)	24"	6/4/93	34 ft. break-in connection on north, pipe cracked around connection, two bricks in pipe 61 ft. factory connection on southeast 103 ft. factory connection on top 180 ft. crack around top of pipe 215.5 ft. total distance of video log
B5	PA50SW217 (8.8)	to PA50SW201 (15.3)	18"	6/10/93	staining on pipe makes cracks difficult to view 72.1 ft. break-in connection in top of pipe 77.5 ft. factory connection in upper left 86.7 ft. break-in connection in upper left 152.6 ft. break-in connection on left (large) 167.7 ft. break-in connection in upper left 172.8 ft. broken and offset joint, soil visible 173.8 ft. factory connection at bottom, filled with silt 182.3 ft. total distance of video log
B6	PA50SW125 (9.25)	to PA50SW219 (11.5)	12"	6/4/93	water flows in PA50SW125 but not out PA50SW219 0 ft. much debris in pipe 27 ft. separated joint 36.2 ft. separated joint 39.1 ft. separated joint, some standing water 49 ft. separated joint 52 ft. separated joint, no more debris in pipe 59 ft. open crack in bottom of pipe 65.8 ft. continued open crack in bottom of pipe, no more water in pipe 70 ft. offset and broken pipe at joint, soil visible 76 ft. separated joint 79 ft. separated joint, soil visible 83 ft. separated joint, soil visible, roots entering pipe 85 ft. badly cracked pipe 91.5 ft. badly cracked and offset pipe, soil visible; PA50SW219 is visible, but cannot get past offset 91.5 ft. total distance of video log
B7	PA50SW218 (5)	to PA50SW219 (11.5)	12"	6/4/93	0 ft. PA50SW218 is interconnection with storm drain and sanitary sewer 20 ft. break-in connection on north 25 ft. crack in pipe 30.5 ft. connection on top 32 ft. crack in side around to top of pipe 34 ft. crack in near top of pipe 42.5 ft. crack on bottom of pipe extending to top 46 ft. crack around entire pipe 50.3 ft. PA50SW219 52.3 ft. pipe crushed 53.2 ft. total distance of video log

**Table 9. Summary of Video Surveys, PA-50, Storm Drains**  
**Parcel B Site Inspection Report**  
**Hunters Point Annex**  
**San Francisco, California**

**Harding Lawson Associates**

Length*	Storm Drain Segment		Pipe Diameter (inches)	Date	Observations at:
	Invert Depth (feet bgs)	Invert Depth (feet bgs)			
B8	PA50SW204 (9)	to PA50SW203 (11.9)	15"	4/26/93	3 ft. crack in top of pipe, top slightly separated; video in black and white 25 ft. brick in pipe, dragged down pipe by camera 45 ft. camera slipped over 93 ft. pipe turns to right, slightly separated joint 95 ft. crack on top of pipe 97 ft. slightly open joint 103 ft. total distance of video log
B9	PA26SW03 (3)	to PA50SW204 (9)	15"	6/14/93	first attempt 4/26/93 unsuccessful; cable blocked at 136 ft. 0 ft. silt, gravel, and leaves 30% in pipe 12 ft. very little silt and debris in pipe 25 ft. more debris in pipe 36 ft. debris covering camera lens 50 ft. break-in connection at top west 55 ft. debris covering camera lens 63.9 ft. total distance of video log; no record for rest of length to PA50SW204 (~216 ft.)
B10	PA50SW218 (5)	to PA50FC212 (8.8)	30"	6/15/93	0 ft. sanitary sewer discharge enters from southwest, sewage visible in manhole 12.3 ft. unknown manhole #1 (not visible on surface), 24" pipe enters from west 25 ft. high tide marks in pipe 1/2 way up sides 87 ft. open joint 94 ft. open and offset joint 122 ft. break-in connection near top at joint, pipe broken and piece missing 136.1 ft. unknown manhole #2 (not visible at surface) 142.9 ft. crack in pipe on southeast 156 ft. two break-in connections near top 161 ft. piece of broken pipe in pipe 168 ft. debris 20% in pipe 192 ft. break-in connection on northwest, staining under connection 193 ft. break-in connection on northwest, staining under connection 254.8 ft. unknown manhole #3, several pipes entering (may be inside of bldg 134) 268 ft. break-in connection on top 308 ft. break-in connection on top 323 ft. silt and debris 30% in pipe 340 ft. catch basin before PA50FC212 356.7 ft. total distance of video log
B11	PA50SW210 (6)	to PA50SW207 (6.9)	18"	6/15/93	first attempt 4/26/93 unsuccessful; cable blocked at 120 ft. 6 ft. slightly open joint 10 ft. silt 25% in pipe 42.3 ft. factory connection upper southwest (6") 50 ft. silt 30% in pipe

**Table 9. Summary of Video Surveys, PA-50, Storm Drains**  
**Parcel B Site Inspection Report**  
**Hunters Point Annex**  
**San Francisco, California**

**Harding Lawson Associates**

Length*	Storm Drain Segment		Pipe Diameter	Date	Observations at:
	Invert Depth (feet bgs)	Invert Depth (feet bgs)			
					80 ft. silt 40% in pipe, partially blocks camera 102.2 ft. factory connection upper southwest (6") 104 ft. almost no silt or water in pipe 117.5 ft. factory connection on northeast (12") 120 ft. standing water 10% in pipe 127 ft. silt 15% in pipe 162 ft. break-in connection on top 214 ft. silt 30% in pipe 239.7 ft. total distance of video log
B12	PA50SW209 (8)	to PA50SW213 N/A	30"	6/15/93	0 ft. water 15% in pipe 27 ft. silt 15% in pipe 66.2 ft. small diameter pipe on bottom of storm drain (debris) 71.4 ft. break-in connection on northeast, crack on top of pipe 74.4 ft. crack around to of pipe at joint 90 ft. silt and water 20% in pipe 117 ft. break-in connection near top on south west 160 ft. silt 30% in pipe 177.8 ft. crack in pipe 181 ft. crack from joint spirals up to break-in connection near top 183 ft. break-in connection near top 187 ft. crack at top of pipe spirals to side at joint at 190' 195.2 ft. factory connection on northeast 198.2 ft. crack near top of pipe, continues to 202' 215 ft. crack on northeast side of pipe spirals under silt 218.6 ft. crack near top on northeast 219.7 ft. break-in connection on top, cracks on top and sides 222.6 ft. crack in pipe 234.1 ft. break-in connection upper northeast 255.4 ft. break-in connection upper northeast 270.2 ft. total distance of video log
B13	PA50SW213 N/A	to PA50FC211 (8.6)	30"	6/15/93	4.5 ft. may be an abandoned manhole 19 ft. break-in connection near top on north east 32.7 ft. break-in connection near top (4") 36.4 ft. crack near top 42.9 ft. total distance of video log
B14	PA50FC211 (8.6)	to PA50SW214 (10)	30"	6/15/93	30 ft. hammer in pipe 78.5 ft. break-in connection on southwest, water flowing from connection 80 ft. crack from break-in connection to joint 109 ft. break-in connection on southwest 135.8 ft. piece of pipe broken and missing at joint on northeast 166.8 ft. break-in connection on lower southwest 210.5 ft. total distance of video log

**Table 9. Summary of Video Surveys, PA-50, Storm Drains  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

Length*	Storm Drain Segment		Pipe Diameter (inches)	Date	Observations at:
	Invert Depth (feet bgs)	Invert Depth (feet bgs)			
B15	PA50SW214 (10)	to PA50SW220 (10.5)	36"	6/15/93	5 ft. factory connection on southeast 11-15 ft. possible crack on southeast 34.9 ft. crack on northwest 39 ft. rock and brick debris 152.3 ft. crack on northwest at joint 158-162 ft. crack in pipe 178.4 ft. total distance of video log
B16	PA50FC212 (8.8)	to PA50SW203 (11.9)	36"	6/22/93	50 ft. water 15% in pipe 60 ft. debris and standing water 89.9 ft. break-in connection at top of pipe 96.8 ft. circular cracked near joint 128 ft. standing water 214 ft. offset joint 235.9 ft. manhole, visible on surface but un-numbered 238.7 ft. offset joint 254.2 ft. break-in connection in upper southeast 301.9 ft. break-in connection upper southeast, leaking pipe 369.8 ft. in PA50SW203, connection on right with gray water flowing 369.8 ft. total distance of video log
B17	PA50SW217 (8.8)	to 112 ft. NE of PA50SW222 (3.9)	12"	6/16/93	12 ft. factory connection 27.2 ft. offset joint, open at top 31 ft. offset joint, open at top 37 ft. offset joint 41 ft. offset joint, open 42 ft. circular crack 52.5 ft. slightly offset joint 57.5 ft. slightly offset joint 64.6 ft. slightly separated joint 82 ft. circular crack on left near joint 154.7 ft. possible circular crack near joint 166 ft. separated joint 174 ft. offset joint 175 ft. factory connection on right 177.7 ft. pipe reduces size to 8"; must approach from PA50SW222 180 ft. total distance of video log
B17	PA50SW222 (3.9)	to 180 ft. SW of PA50SW217 (8.8)	8"	6/16/93	6.4 ft. pipe angles upward 9 ft. pipe angles downward 10 ft. pipe levels 47 ft. spiral crack on left 112 ft. pipe diameter enlarges to 12"; see above for remainder of this length 112 ft. total distance of video log

\* Location of video survey lengths shown on Plates 16B and 21.

N/A Not available.

**Table 10. Proposed Work Plan, PA-50, Storm Drains  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

<b>Location</b>	<b>Rationale/Activity</b>	<b>Station Designation</b>	<b>Type (Number)</b>	<b>Total Depth (feet bgs)</b>	<b>Sampling Interval (feet bgs)</b>	<b>Estimated # of Samples/ Type</b>	<b>Lab Analyses</b>
PA-26 Catch Basin	Evaluate presence of chemicals in soil beneath representative storm drain catch basin	TA16	Test Pit (1)	TBD	TBD	2 /s	All

**Estimated Total**

**2 /s**

All Laboratory analyses include CLP VOCs, CLP SOC's, CLP pesticides/PCBs, TPH-D/-G, TRPH, CLP metals, and pH.  
bgs Below ground surface.  
TBD To be determined.  
(i) Sampling location will be selected after evaluating configuration at catch basins, following clean out by Navy. A location map will be prepared and relayed to agencies using field variance protocol.  
/s Soil sample.

**Table 11. Summary of Access Point Observations, PA-50, Sanitary Sewers  
Parcel B Site Investigation Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

<b>Location</b>	<b>Invert Cover</b>	<b>Invert Construction</b>	<b>Invert Condition</b>	<b>Invert Depth (ft. bgs)</b>	<b>OVA/Gastech (ppm)</b>	<b>Other Observations</b>
<b>Parcel B</b>						
PA50SN200	solid	precast	good	6.5	0	Rusted rungs, 1 foot of sediment
PA50SN201	solid	precast	good	7.5	0	Rusted rungs, small amount of sediment
PA50SN202	solid	precast	good	6.9	0	Rusted rungs
PA50SN203	solid	precast	good	7.4	0	Rusted rungs
PA50SN204	solid	precast	good	7.7	0	Rusted rungs
PA50SN205	solid	precast	good	8.2	1	Rusted rungs
PA50SN206	solid	precast	good	8.8	50	Rusted rungs
PA50SN207	solid	precast	good	9.8	3	Rusted rungs
PA50SN208	solid	precast	good	6.7	0	Rusted rungs
PA50SN209	solid	precast	good	6.2	0	Rusted rungs
PA50SN210	solid	precast	good	9.9	0	Rusted rungs
PA50SN211	solid	precast	good	10.2	0	Rusted rungs
PA50SN212	solid	precast	good	11.6	3	Rusted rungs
PA50SN213	solid	precast	good	11.6	0	
PA50SN214	solid	precast	good	11.5	0	
PA50SN215	solid	precast	good	4.5	0	
PA50SN216	solid	precast	good	11.1	1	
PA50SN217	solid	precast	good	5.9	0	Possible interconnection with storm drain
PA50SN218	solid	precast	good	4.9	0	
PA50SN219	solid	N/O	good	9.5	0	
PA50SN220	solid	brick	good	5.4	0	Rusted rungs
PA50SN221	solid	precast	good	7.0	0	
PA50SN222	solid	precast	good	11.3	0	



**Table 11. Summary of Access Point Observations, PA-50, Sanitary Sewers  
Parcel B Site Investigation Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

<b>Location</b>	<b>Invert Cover</b>	<b>Invert Construction</b>	<b>Invert Condition</b>	<b>Invert Depth (ft. bgs)</b>	<b>OVA/Gastech (ppm)</b>	<b>Other Observations</b>
<b>Parcel B</b>						
PA50SN223	solid	precast	good	10.0	0	
PA50SN224	solid	precast	good	9.1	0	
PA50SN225	solid	precast	good	3.9	0	
PA50SN226	solid	precast	good	11.9	0	
PA50SN227	solid	precast	good	6.5	0	
PA50SN228	solid	precast	good	10.2	0	Cover broken
PA50SN229	solid	precast	good	10.3	0	
PA50SN230	solid	precast	good	6.6	0	
PA50SN231	solid	precast	good	5.4	0	Rusted rungs, possible sandblast sand in sewer
PA50SN232	solid	precast	good	4.6	0	Rusted rungs
PA50SN233	solid	precast	good	7.2	0	Rusted rungs, strong flow rate from direction of inactive building
PA50SN234	solid	precast	good	8.1	0	Rusted rungs
PA50SN235	solid	precast	good	20.0	0	Rusted rungs

NM = Not measured

**Table 12. Proposed Work Plan, PA-50, Sanitary Sewers  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

<b>Location</b>	<b>Rationale/Activity</b>	<b>Station Designation</b>	<b>Type (Number)</b>	<b>Total Depth (feet bgs)</b>	<b>Sampling Interval (feet bgs)</b>	<b>Estimated # of Samples/ Type</b>	<b>Lab Analyses</b>
Near sanitary sewer inspection point PA50SN235	Evaluate upgradient extent of contaminants in sanitary sewer lines	SN213-SN235 SN235-SN233 SN235-SN303	Sewer Water (12)	NA	NA	12 /w	All
<b>Estimated Total</b>						<b>12 /w</b>	

All      Laboratory analyses include CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-D/-G, TRPH, CLP metals, and pH.  
bgs      Below ground surface.  
NA      Not applicable.  
/w      Water sample.

**Table 13. Proposed Work Plan, PA-51, Former Transformer Sites  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

<b>Location</b>	<b>Rationale/Activity</b>	<b>Station Designation</b>	<b>Type (Number)</b>	<b>Total Depth (feet bgs)</b>	<b>Sampling Interval (feet bgs)</b>	<b>Estimated # of Samples/ Type</b>	<b>Lab Analyses</b>
<b>BUILDING 128</b>							
Soil near PA51SS02 inside building	Evaluate and excavate PCB-contaminated soil	EE22	Exploratory Excavation (1)	(i)	Base/sides of excavation	3 /s/c	All
<b>Estimated Total</b>						<b>3 /s</b>	

All      Laboratory analyses include VOCs, SOCs, pesticides/PCBs, TPH-D/-G, TRPH, and metals.  
bgs      Below ground surface.  
(i)      Total depth of EE dependent on visual observations and field screening.  
/s      Soil sample.  
/c      Confirmation sample.

**Table 14. Former and Current Transformer Locations, PA-51  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

Building # /Location	Electrical Substation	Sampling Station #	Evidence of Release to Environment	Comments
125		PA51SS01	Trace	Transformer pad to NE of building. Transformers were mounted over a sump and possibly in a sump. 4 inches of standing water in sump, thin patchy sheen on water. No staining on ground.
128/131	U	PA51SS02, -SS03	Y	Transformer (with PCB sticker) outside on pallet, removed from original location; no staining observed. Staining found on concrete floor beneath former transformer locations in Substation U.
129	U-2		N	Former transformer location outside building; no staining observed. Very minor staining on wood sub-floor and thick tar-like material on switch box in SW end of building.
132	U-1		N	Former transformer location outside building; no staining observed. Minor staining on wood floor and thick tar-like material on switch box and concrete in SW end of building.
156			N	3.5'x2' metal/concrete pad on NE side of is probable former location of transformers. No staining observed. No evidence of former transformer location inside building.
Drydock 7	MH331		N	Possible locations of former transformer sites observed along lower walkways of drydock and in vaults between drydock and Berths 63 and 64. No evidence of staining.
Drydock 5	MH148		N	No obvious former transformer location in vicinity of drydock. No evidence of staining. Area over water.
113	S	PA51SS04	Y	Stain on concrete below former transformer location in substation S. Active transformer outside Building 113A; no staining observed.
123	T	PA51SS05	Y	Transformers removed from SE corner of substation. Staining present below former transformer locations and throughout substation.
122	V	PA51SS06 PA51SS07	Y	No evidence of staining at what is thought to be the former transformer location. There are 7 removed transformers being stored in building; one is leaking onto the concrete and has a PCB sticker on it. Some staining beneath transformers located outside of building. Transformers have <50 ppm PCBs stickers.
130	U-3		N	No evidence of staining on concrete floor or in sump area.
140	B		N	No evidence of staining beneath former transformer location. Most of building has basement area beneath it.

**Table 15. Proposed Work Plan, PA-23, Buildings 146, 161, and 162, USTs 2 and 3  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

Harding Lawson Associates

Location	Rationale/Activity	Station Designation	Type (Number)	Total Depth (feet bgs)	Sampling Interval (feet bgs)	Estimated # of Samples/ Type	Lab Analyses
<b>BUILDING 146</b>							
Soil near PA23SS04	Evaluate and excavate soil near sump at SE corner	EE08	Exploratory Excavation (1)	(i)	Base/sides of excavation	3 /s/c	All
Soil below ASTs	Evaluate and excavate stained soil below ASTs	EE10	Exploratory Excavation (1)	(i)	Base/sides of excavation	3 /s/c	All
<b>BUILDING 161</b>							
Soil near PA23SS06	Evaluate and excavate shallow surface soils	EE09	Exploratory Excavation (1)	(i)	Base/sides of excavation	3 /s/c	All
<b>UST 2</b>							
Tank S-135	Evaluate lateral and vertical of SOC's in soil and presence in groundwater	B003-B012	Borings/ Hydropunch (10)	15	5, 10, 15	30 /s	All
		MW13A-MW15A	Monitoring Wells (3) (ii)	25 (iii)	5, 10, 15, 20, 25	10 /w 15 /s 9 /w	HP1 All
<b>UST 3</b>							
Tank S-136	Evaluate lateral and vertical of SOC's and PCBs in soil and presence in groundwater	B003-B008	Borings/ Hydropunch (6)	15	5, 10, 15	18 /s	All
		MW09A-MW11A	Monitoring Wells (3) (ii)	25 (iii)	5, 10, 15, 20, 25	6 /w 15 /s 9 /w	HP1 All
<b>Estimated Total</b>						87 /s 34 /w	

All Laboratory analyses include CLP VOCs, CLP SOC's, CLP pesticides/PCBs, TPH-D/-G, TRPH, CLP metals, and pH.  
 HP1 Laboratory analyses include EPA Test Methods 8010/8020 and TPH as diesel and gasoline.  
 bgs Below ground surface.  
 (i) Total depth of exploratory excavation (EE) dependent upon visual observations and field screening.  
 (ii) Locations of monitoring wells will be determined after evaluation of the Hydropunch analytical data; locations will be relayed to agencies using field variance protocol. Three rounds of groundwater samples will be collected from each well.  
 (iii) Borings to reach bedrock or bay mud.  
 /s Soil sample.  
 /c Confirmation sample.  
 /w Water sample.

**Table 16. Proposed Work Plan, PA-24, Buildings 124, 125, 128, and 130  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

<b>Location</b>	<b>Rationale/Activity</b>	<b>Station Designation</b>	<b>Type (Number)</b>	<b>Total Depth (feet bgs)</b>	<b>Sampling Interval (feet bgs)</b>	<b>Estimated # of Samples/ Type</b>	<b>Lab Analyses</b>
<b>BUILDING 130</b>							
Near Sump	Evaluate lateral and vertical extent of TCE in soil and groundwater	B011, B012 MW04A	Borings (2), Monitoring Well (1) (i)	20 (ii)	0, 2.5, 5, 10, 15, 20	18 /s 3 /w	All
<b>ACROSS PA-24</b>	Sample existing wells for 2 remaining rounds	PA24MW01A, PA24MW02A, PA24MW03A	Monitoring Wells (3) (i)	NA	NA	6 /w	All

**Estimated Total**

**18 /s  
9 /w**

**All** Laboratory analyses include CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-D/-G, TRPH, CLP metals, and pH.  
**bgs** Below ground surface.  
**NA** Not applicable.  
**(i)** Three rounds of groundwater samples will be collected from each well.  
**(ii)** Borings to reach bedrock or bay mud.  
**/s** Soil sample.  
**/w** Water sample.

**Table 17. Proposed Work Plan, PA-25, Building 134  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

<b>Location</b>	<b>Rationale/Activity</b>	<b>Station Designation</b>	<b>Type (Number)</b>	<b>Total Depth (feet bgs)</b>	<b>Sampling Interval (feet bgs)</b>	<b>Estimated # of Samples/ Type</b>	<b>Lab Analyses</b>
<b>BUILDING 134</b>							
Dip tank and lateral floor drain inside building	Evaluate lateral and vertical extent of contaminants in soil and groundwater	B011-B013 (i)	Borings (3)	15	0, 5, 10, 15	12 /s 3 /w	All
Oily-liquid filled sump outside W end of building	Evaluate lateral and vertical extent of contaminants in soil and groundwater	B014 (i)	Boring (1)	15	0, 5, 10, 15	4 /s 1 /w	All
<b>Estimated Total</b>						<b>16 /s 4 /w</b>	

All      Laboratory analyses include CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-D/-G, TRPH, CLP metals, and pH.  
bgs      Below ground surface.  
(i)      It is anticipated that two of the four borings will be converted to monitoring wells; locations to be based on field observations.  
/s      Soil sample.  
/w      Water sample.

**Table 18. Proposed Work Plan, PA-26, Building 157 and Area XIV  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

<b>Location</b>	<b>Rationale/Activity</b>	<b>Station Designation</b>	<b>Type (Number)</b>	<b>Total Depth (feet bgs)</b>	<b>Sampling Interval (feet bgs)</b>	<b>Estimated # of Samples/ Type</b>	<b>Lab Analyses</b>
<b>BUILDING 157</b>							
Soil Floor Area	Evaluate soil conditions near composite sample PA26SS02 and storm drain	B010-B013	Borings (4)	10	0, 2.5, 5, 10	16 /s 4 /w	All
Outside NE corner	Evaluate and excavate stained and oily soil at overturned drum	EE14	Exploratory Excavation (1)	(i)	Base/sides of excavation	3 /s/c	All
<b>BUILDING 141</b>							
Outside S side	Evaluate and excavate shallow soil below possible wood-treatment cylinder	EE15	Exploratory Excavation (1)	(i)	Base/sides of excavation	3 /s/c	All

**Estimated Total**

**22 /s  
4 /w**

All Laboratory analyses include CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-D/-G, TRPH, CLP metals, and pH.  
bgs Below ground surface.  
(i) Total depth of exploratory excavation (EE) dependent upon visual observations and field screening.  
/s Soil sample.  
/c Confirmation sample.  
/w Water sample.



**Table 19. Proposed Work Plan, PA-42, Buildings 109 and 113  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

<b>Location</b>	<b>Rationale/Activity</b>	<b>Station Designation</b>	<b>Type (Number)</b>	<b>Total Depth (feet bgs)</b>	<b>Sampling Interval (feet bgs)</b>	<b>Estimated # of Samples/ Type</b>	<b>Lab Analyses</b>
<b>BUILDING 109</b>							
West side	Visual inspection and removal of suspected oil/water reservoir	EE08	Exploratory Excavation (1)	(i)	Base/sides of excavation	3 /s/c	All
<b>Estimated Total</b>						<b>3 /s</b>	

**All**      *Laboratory analyses include CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-D/-G, TRPH, CLP metals, and pH.*

**bgs**      *Below ground surface.*

**(i)**      *Total depth of exploratory excavation (EE) dependent upon visual observations and field screening.*

**/s**      *Soil sample.*

**/c**      *Confirmation sample.*

**Table 20. Proposed Work Plan, PA-57, Drydock 4 Area  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

<b>Location</b>	<b>Rationale/Activity</b>	<b>Station Designation</b>	<b>Type (Number)</b>	<b>Total Depth (feet bgs)</b>	<b>Sampling Interval (feet bgs)</b>	<b>Estimated # of Samples/ Type</b>	<b>Lab Analyses</b>
Soil near PA57SS14	Evaluate and excavate soil with elevated TOG and arsenic	EE16	Exploratory Excavation (1)	(i)	Base/sides of excavation	3 /s/c	All
Soil near PA57SS15 at Hazardous Waste Accumulation Area	Evaluate and excavate soil with elevated TOG	EE17	Exploratory Excavation (1)	(i)	Base/sides of excavation	3 /s/c	All
<b>Estimated Total</b>						<b>6 /s</b>	

All      Laboratory analyses include CLP VOCs, CLP SOCs, CLP pesticides/PCBs, TPH-D/-G, TRPH, CLP metals, and pH.  
bgs      Below ground surface.  
(i)      Total depth of exploratory excavation (EE) dependent on visual observations and field screening.  
/s      Soil sample.  
/c      Confirmation sample.

**Table 21. Summary of Proposed Work Plans, Parcel B  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

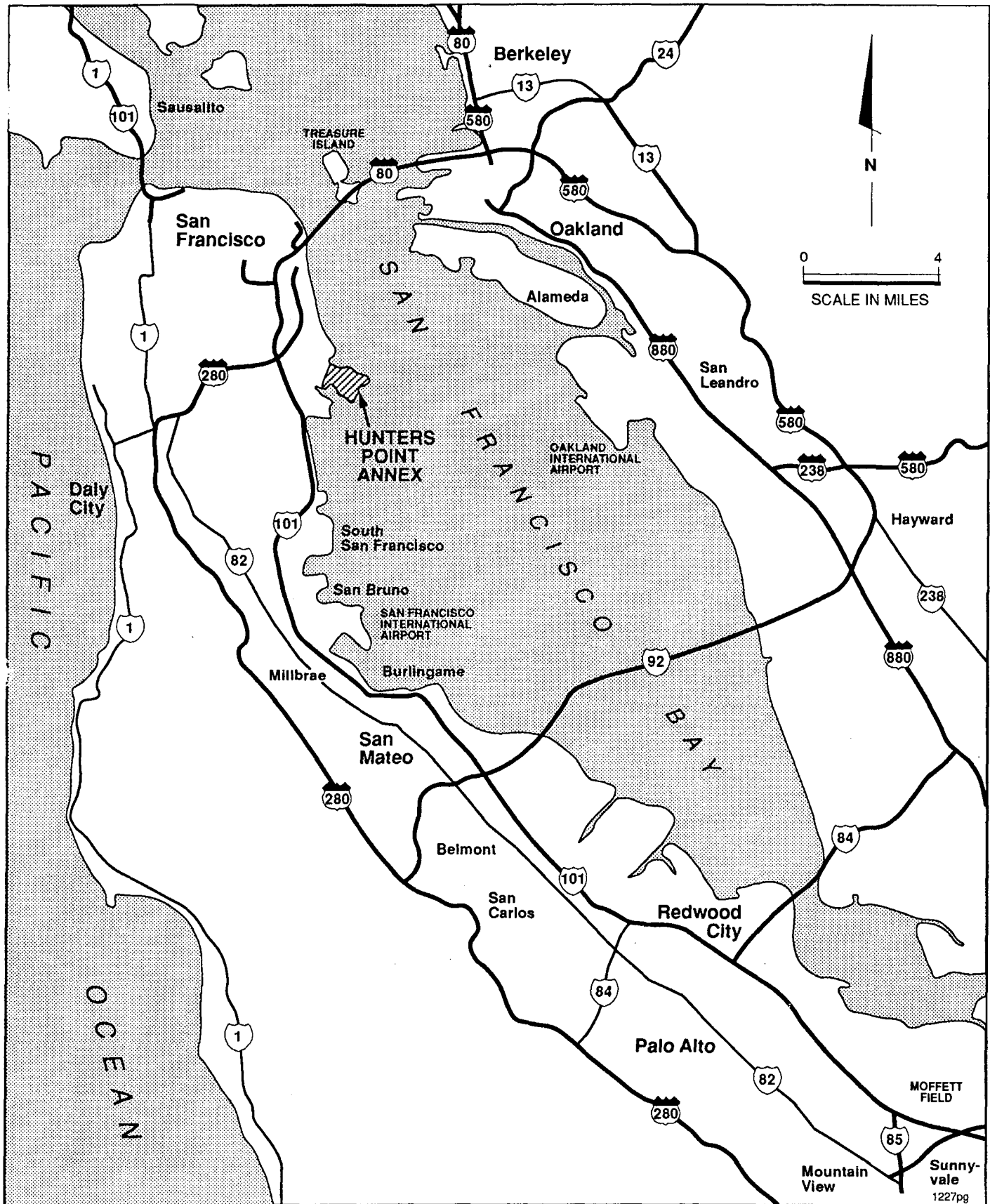
<b>Investigation</b>	<b>Site</b>	<b>Building/Area</b>	<b>Type (Number)</b>
<b>UTILITIES</b>	PA-45	Steam Lines Parcel B	Remove accessible friable asbestos * Drain lines *
		Drydock 4 Area	B (TBD)
	PA-46	Fuel lines Entire system	Drain fluids/remove lines and soil if contaminated *
		Vicinity of Bldg. 130	B (15), HP (22), MW (TBD)
	PA-50	Sanitary Sewers System upstream of PA50SN235	W (12)
	PA-50	Storm Drains PA-26 Catch basin	C/TA (1)
<b>BUILDING SITES</b>	PA-51	Bldg. 128 PA51SS02 & -SS03	EE (1) *
	PA-23	Bldg. 146	
		Near small vaults	EE (1) *
		After removal of ASTs	EE (2) *
	PA-24	Former Bldg. 161	EE (1) *
		Bldg. 130	
		Near solvent sump	B/GW (2), MW (1)
	PA-25	Bldg. 134	
		Interior dip tank and floor drain	B/GW (3)
	PA-26	Exterior sump	B/GW (1)
		Bldg. 157	
		Area of staining on soil floor	B/GW (4)
	PA-26	Overtured drum	EE (1) *
		Bldg. 141	
	PA-26	Near wood-treatment cylinder	EE (1) *

**Table 21. Summary of Proposed Work Plans, Parcel B  
Parcel B Site Inspection Report  
Hunters Point Annex  
San Francisco, California**

**Harding Lawson Associates**

Investigation	Site	Building/Area	Type (Number)
	PA-31	Former Bldg. 114 No further investigation	
	PA-42	Bldg. 109 - buried object Buried oil/water reservoir	EE (1) *
	PA-57	Drydock 4 Hazardous Waste Accumulation Are	EE (2) *
<b>DATA GAPS</b>	IR-6	Tank Farm VOCs in bedrock	MW (7)
	IR-10	Bldg. 123 VOC plume in A-aquifer	MW (2)
	IR-18	Waste Oil Disposal Area West, south, and center of IR site	B (16)
	IR-20	Bldg. 156 Near Boring IR20B010	MW (1)
<b>UST SCOPE</b>	S. of PA-23	Bldg. 116 Site 2 (Tank S-135)	HP (10), MW(3)
		Bldg. 117 Site 3 (Tank S-136)	HP (6), MW(3)
<b>B</b>	Boring.	<b>MW</b>	Monitoring Well.
<b>C</b>	Clean Out/Evaluate Condition.	<b>TA</b>	Test Pit.
<b>EE</b>	Exploratory Excavation.	<b>TBD</b>	To Be Determined.
<b>GW</b>	Grab Groundwater.	<b>W</b>	Sewer Water.
<b>HP</b>	Hydropunch.	<b>*</b>	Work to be performed outside of the RI program.

**PLATES**



**Harding Lawson Associates**  
Engineering and  
Environmental Services

DRAWN  
PMc

JOB NUMBER  
11400 090502

APPROVED  
*SLP*

DATE  
6/92

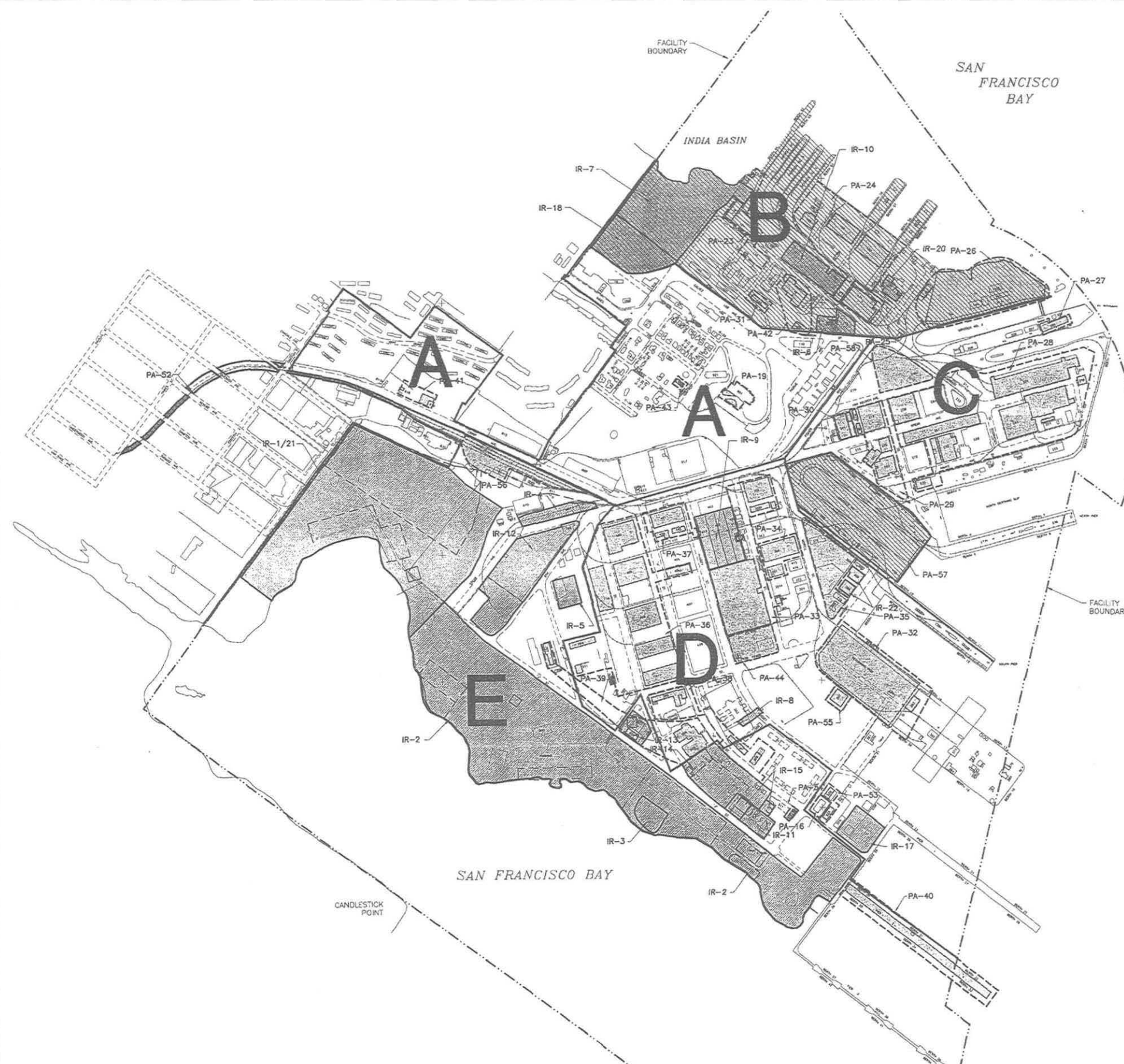
REVISED DATE

**Facility Location Map**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

PLATE

**1**

1227pg



EXPLANATION:

- AREA OF INVESTIGATION IN THIS REPORT
- EXISTING IR SITE
- BUILDING OR AREA IDENTIFIED FOR INVESTIGATION WITHIN A PA SITE
- EXISTING BUILDING
- LOCATION OF FORMER BUILDING
- IR SITE BOUNDARY
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- CRANE OR RAILROAD TRACKS
- FENCE
- ROADWAY

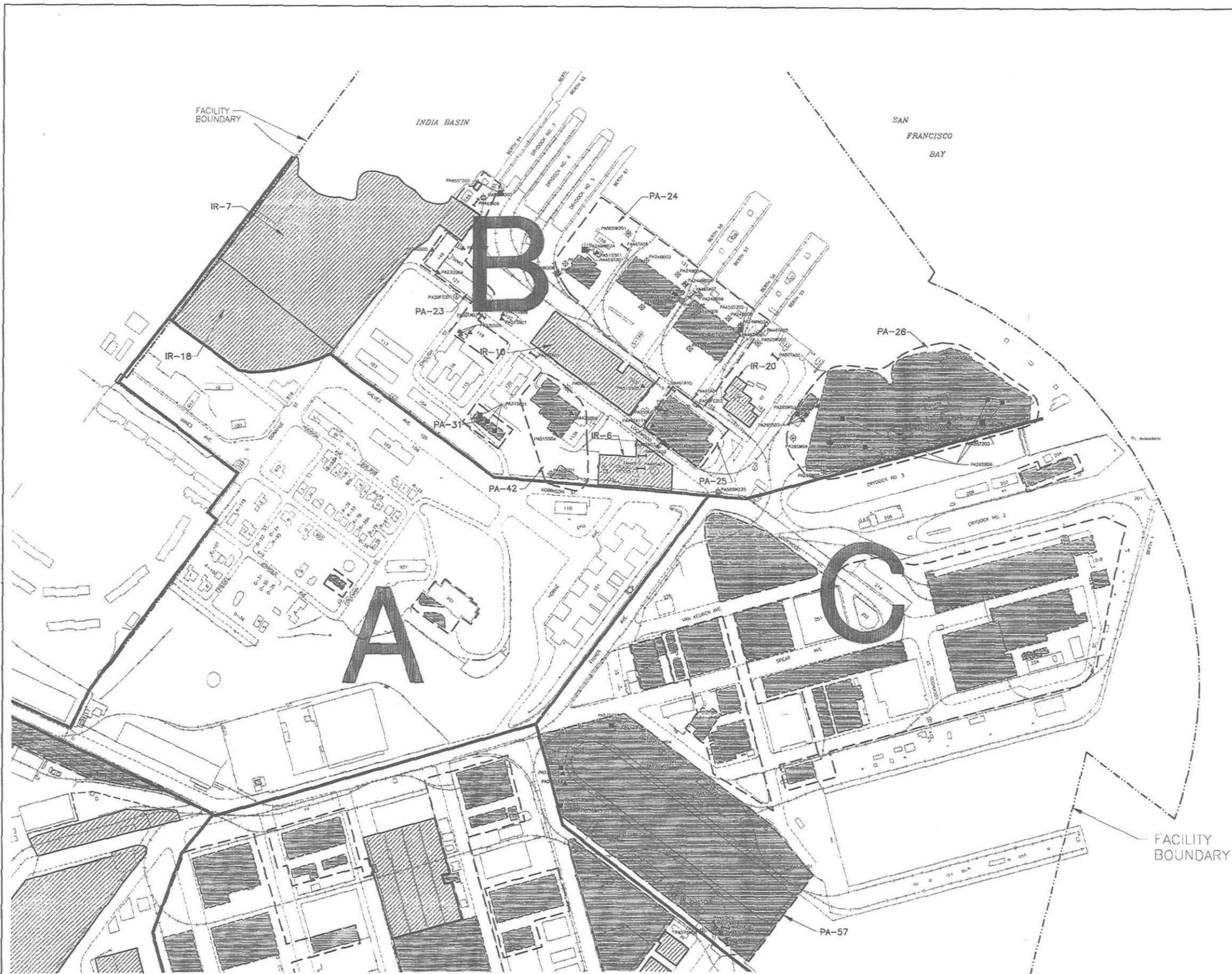
IR SITE NO.	AREA DESIGNATION	PA SITE NO.	BUILDING NUMBER/AREA DESIGNATION
1/21	INDUSTRIAL LANDFILL	16	CONTAINER STORAGE AREA
2	BAY FILL AREA	19	901
3	OIL RECLAMATION PONDS	23	146, 161, 162
4	SCRAP YARD	24	124, 125, 128, 130
5	OLD TRANSFORMER STORAGE YARD	25	134
6	TANK FARM	26	157, AREA XIV
7	SUB-BASE AREA	27	205
8	PCB SPILL AREA	28	211/253, 219, 230, 231, 258, 270, 271, 281
9	PICKLING AND PLATE YARD	29	203, 217, 275, 279, 280, 282
10	BATTERY AND ELECTROPLATING SHOP (BUILDING 123)	30	241
11	BUILDING 521, POWER PLANT AREA	31	114
12	DISPOSAL TRENCH AREA	32	REGUNNING PIER, 383
13	OLD COMMISSARY AREA	33	302, 302A, 304, 364, 411, 418
14	OILY LIQUID WASTE DISPOSAL AREA	34	351, 366
15	OILY WASTE PONDS AND INCINERATION TANK	35	274, 306, AREA BOUNDED BY MANSEAU, MORELL, AND E STREETS
17	DRUM STORAGE AND DISPOSAL AREA	36	371, 400, 404A, 405, 406, 413, 414, 704, 710, PARTS OF AREA IV
18	WASTE OIL DISPOSAL AREA	37	401, 423, 435, 436
20	BUILDING 156	38	500, 506, 507, 509, 510
22	BUILDINGS 368, 369	39	505, 707
		40	527, PIER 2
		41	816, 818
		42	108, 113
		43	906
		44	438, AREA NEAR BUILDINGS 408, 409, 410
		45*	STEAMLINES
		46*	FUEL DISTRIBUTION LINES, TANK FARM
		47*	FUEL DISTRIBUTION LINES, TANK S-505
		48*	SUSPECTED STEAMLINES, FORMER BUILDING 503
		49*	FUEL DISTRIBUTION LINES, BUILDINGS 205, 203
		50*	STORM DRAIN AND SANITARY SEWER LINES
		51*	FORMER TRANSFORMER SITES
		52	RAILROAD RIGHT-OF-WAY
		53	525, 530
		54	511A
		55	307
		56	AREA VII, RAILROAD TRACKS
		57	DRYDOCK 4 AREA
		58	SCRAP YARD ACROSS FROM BUILDING 528

\* NOT SHOWN

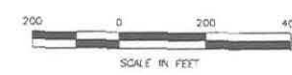


A 02/09		CSN	DRAWN	PROJECT NO. 11400 090502		Harding Lawson Associates Engineering and Environmental Services	DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND WESTERN DIVISION San Bruno, California		HPA FACILITY MAP		PLATE 2
			ENGINEER	SCALE: 1"=400'			Parcel B Site Investigation Report		SHEET 1 OF		
			CHECKED	APPROVED: <i>WJW</i>			Naval Station Treasure Island		REVISION NUMBER:		
				DATE:			Hunters Point Annex		DATE:		
NO	DATE	REVISIONS		BY	CHK	DATE	San Francisco, California				



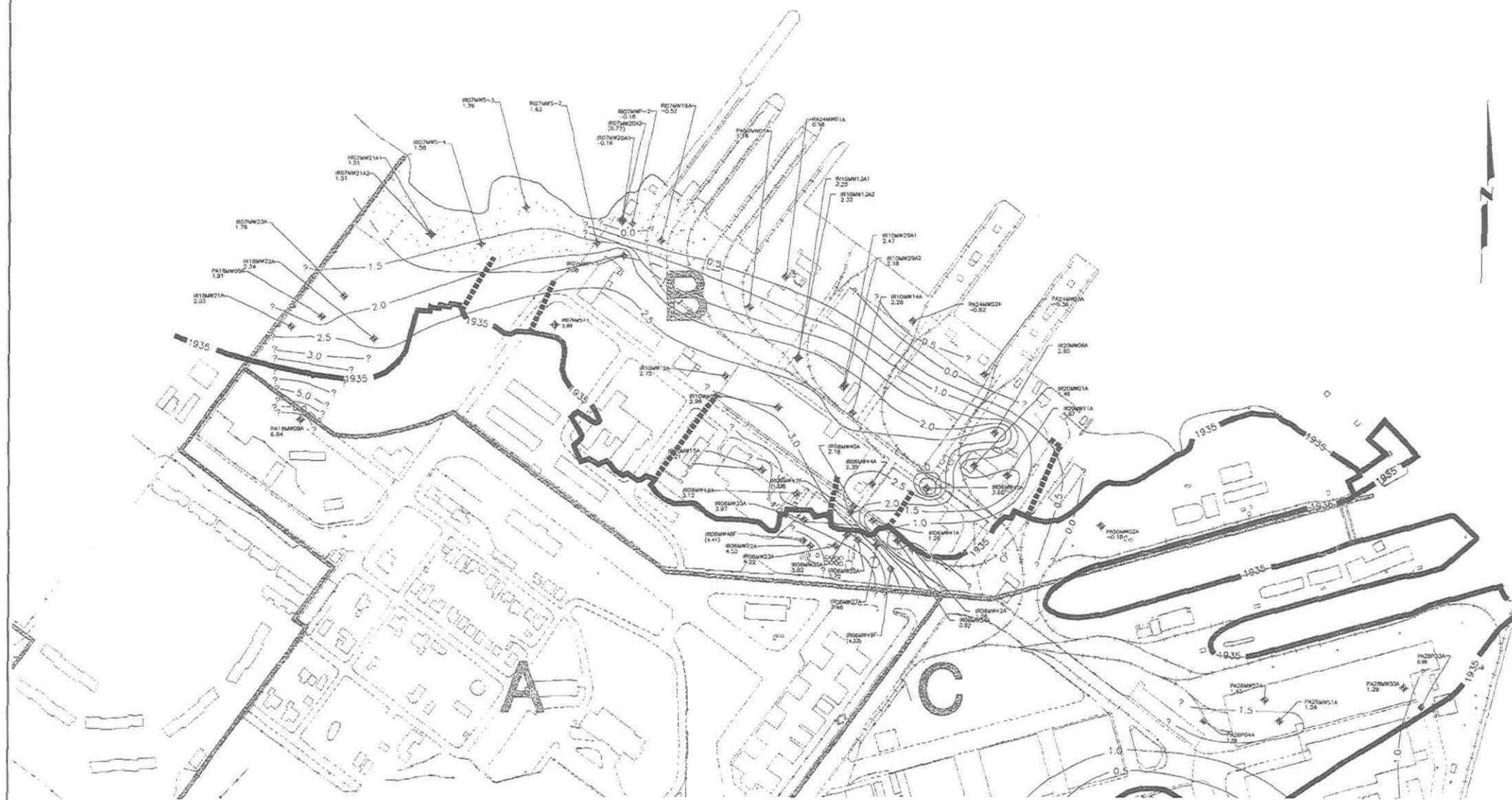


- EXPLANATION:**
- SI SAMPLING LOCATIONS**
- PA240003 SOIL BORING
  - PA240003A A-AQUIFER MONITORING WELL
  - PA240003B SURFACE SOIL SAMPLE
  - PA240003C SAND BLAST MATERIAL
  - PA240003D TEST PIT; SYMBOL DOES NOT REPRESENT TRUE LENGTH OF TEST PIT
  - PA240003E STORM DRAIN SEDIMENT SAMPLE
  - PA240003F CATCH BASIN
  - PA240003G FLOOD CONTROL GATE
  - PA240003H SANITARY SEWER
  - PA240003I STEAMLINE INSPECTION AND BORESCOPE
  - PA240003J SUMP SAMPLE
  - PA240003K ASBESTOS
- EXISTING IR SITE
  - BUILDING OR AREA IDENTIFIED FOR INVESTIGATION WITHIN A PA SITE
  - PA SITE BOUNDARY
  - PARCEL BOUNDARY
  - RAILROAD TRACKS
  - FENCE



DRAWN: DEK ENGINEER: CHECKED: APPROVED: <i>WMA</i>		PROJECT NO: 11400 090502 SCALE: 1"=200' APPROVED: <i>WMA</i>	 <b>Harding Lawson Associates</b> Engineering and Environmental Services	DEPARTMENT OF THE NAVY WESTERN DIVISION San Bruno, California		NAVAL FACILITIES ENGINEERING COMMAND Parcel B Site Inspection Report Naval Station Treasure Island Hunters Point Annex San Francisco, California	SITE MAP, PARCEL B	PLATE 3
				REVISIONS NO. DATE BY CHK DATE				SHEET OF REVISION NUMBER: DATE: 5/93





- EXPLANATION:**
- R/SI WELLS**
- R24MW03A A-AQUIFER MONITORING WELL
  - R24MW04A BEDROCK MONITORING WELL
  - R24MW04A A-AQUIFER PIEZOMETER
- PRC-R/PA WELLS**
- R27MW02-2 A-AQUIFER MONITORING WELL
  - R27MW02-1 BEDROCK MONITORING WELL
  - 0.36 GROUNDWATER ELEVATION (FEET MSL)
  - (4.47) GROUNDWATER ELEVATION NOT USED IN CONTOURING (FEET MSL)
  - NM WATER LEVEL NOT MEASURED DUE TO PONDED SURFACE WATER OVER THE WELL COVER
  - 2.0 A-AQUIFER WATER-LEVEL ELEVATION CONTOUR (FEET MSL) (CONTOUR INTERVAL = 0.5 FEET)
  - 1935 APPROXIMATE LOCATION OF 1935 SHORELINE, BASED ON AIR PHOTO INTERPRETATION
  - ORIGINAL DOCKS PRESENT ALONG 1935 SHORELINE
  - APPROXIMATE AREA OF DIRECT TIDAL INFLUENCE IN PARCEL B BASED ON INTERPRETATION OF SALINITY AND TDS RESULTS AND WATER LEVEL FLUCTUATIONS

- NOTES:**
- 1) ALL WATER LEVELS WERE MEASURED AUGUST 16, 1993
  - 2) WATER-LEVEL ELEVATION CONTOUR MAPS ARE BASED ON ONE INTERPRETATION OF THE DATA. OTHER INTERPRETATIONS ARE POSSIBLE.
  - 3) BECAUSE FACILITY-WIDE GROUNDWATER LEVELS WERE TAKEN OVER A 7-HOUR PERIOD, GROUNDWATER CONTOURS MAY BE AFFECTED IN AREAS WITH TIDAL INFLUENCE. TIDAL FLUCTUATION OBSERVED DURING DATA COLLECTION PERIOD RANGED FROM 1.3 TO 6.9 FEET MSL.



NO.	DATE	REVISIONS	BY	CHK	DATE

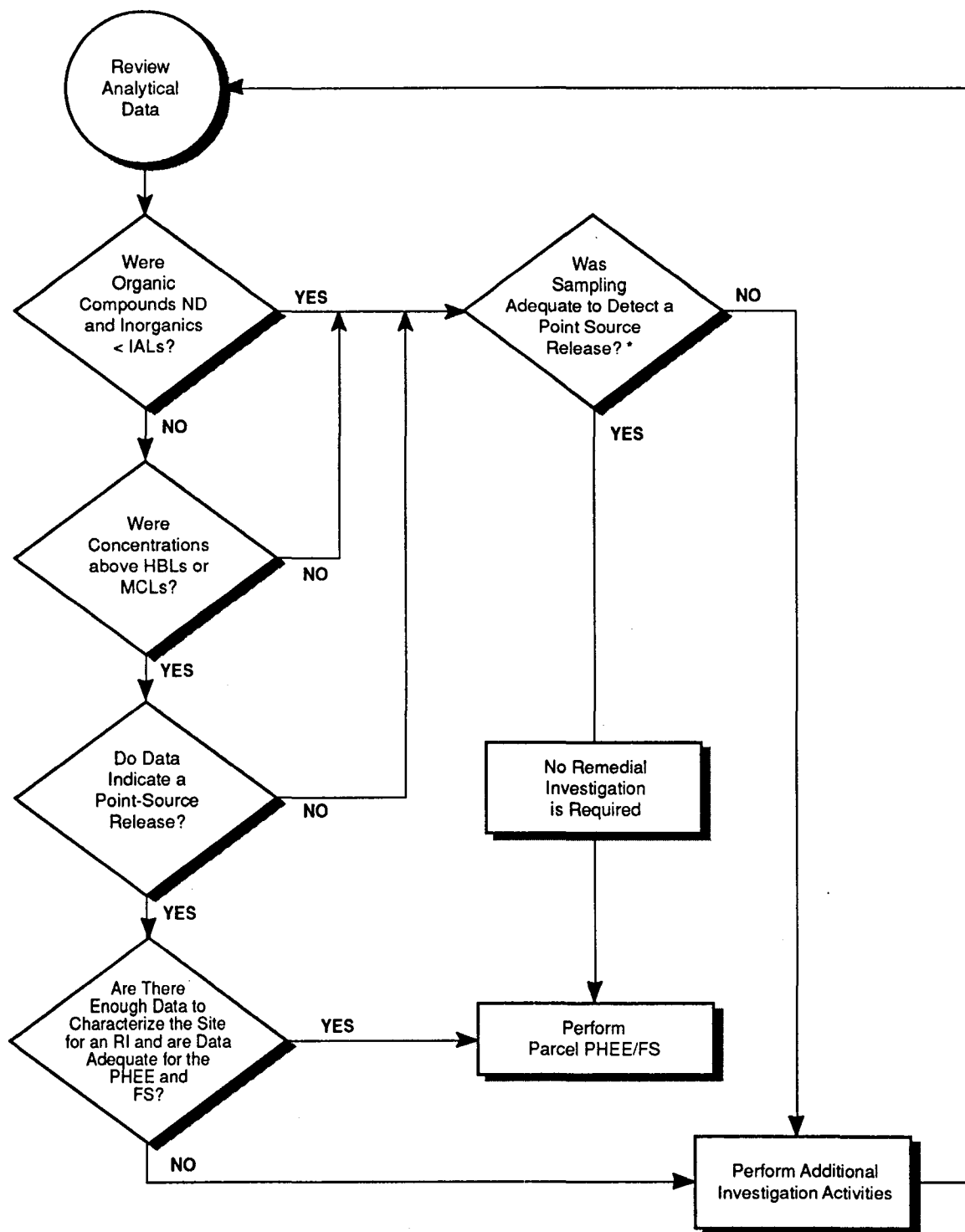
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 ENGINEER: SCALE: 1" = 400'  
 CHECKED: APPROVED: [Signature]  
 DATE: DATE:

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 Engineering and Environmental Services

DEPARTMENT OF THE NAVY  
 WESTERN DIVISION  
 Naval Facilities Engineering Command  
 Parcel B Site Inspection Report  
 Naval Station Treasure Island  
 Hunters Point Annex  
 San Francisco, California

PARCEL B GROUNDWATER ELEVATION MAP  
 AUGUST 1993

PLATE	4
SHEET	OF
REVISION NUMBER	0
DATE	



ND = Not detected  
 <IALs = Less than Interim Ambient Levels  
 \* = Based on (1) Site History and (2) Sample Locations

0329pg



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**SI Data Evaluation Flow Chart**  
 Parcel B Site Inspection Report  
 Naval Station Treasure Island  
 Hunters Point Annex  
 San Francisco, California

FIGURE

**5**

DRAWN  
DJP

JOB NUMBER  
11400 090502

APPROVED  
WWM

DATE  
3/94

REVISED DATE

# RECEPTOR



Child Resident



Adult Resident



Commercial Worker

## RISK LEVEL/TYPE



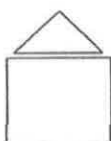
Exceeds 10-4 HBLc



Exceeds 10-5 HBLc



Exceeds 10-6 HBLc



Exceeds HBLn

## EXAMPLES



Exceeds 10-6 HBLc for Adult Resident  
Exceeds HBLn for Commercial Worker



Exceeds 10-4 HBLc for Child Resident  
Exceeds 10-5 HBLc for Adult Resident  
Exceeds 10-5 HBLc and HBLn for Commercial Worker

## NOTE

- 1) HBLc = Health Based Level for carcinogenic chemical
- 2) HBLn = Health Based Level for noncarcinogenic chemical
- 3) HBLs have been calculated for groundwater, shallow soil (0-2 feet bgs), and deep soil (below 2 feet bgs); storm drain sediments were compared to deep soil HBLs.
- 4) Other water samples (i.e., water from sanitary sewers, steamlines, etc.) are not compared to HBLs or IALs.



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Key to Health Risk Notation System  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

PLATE

**6**

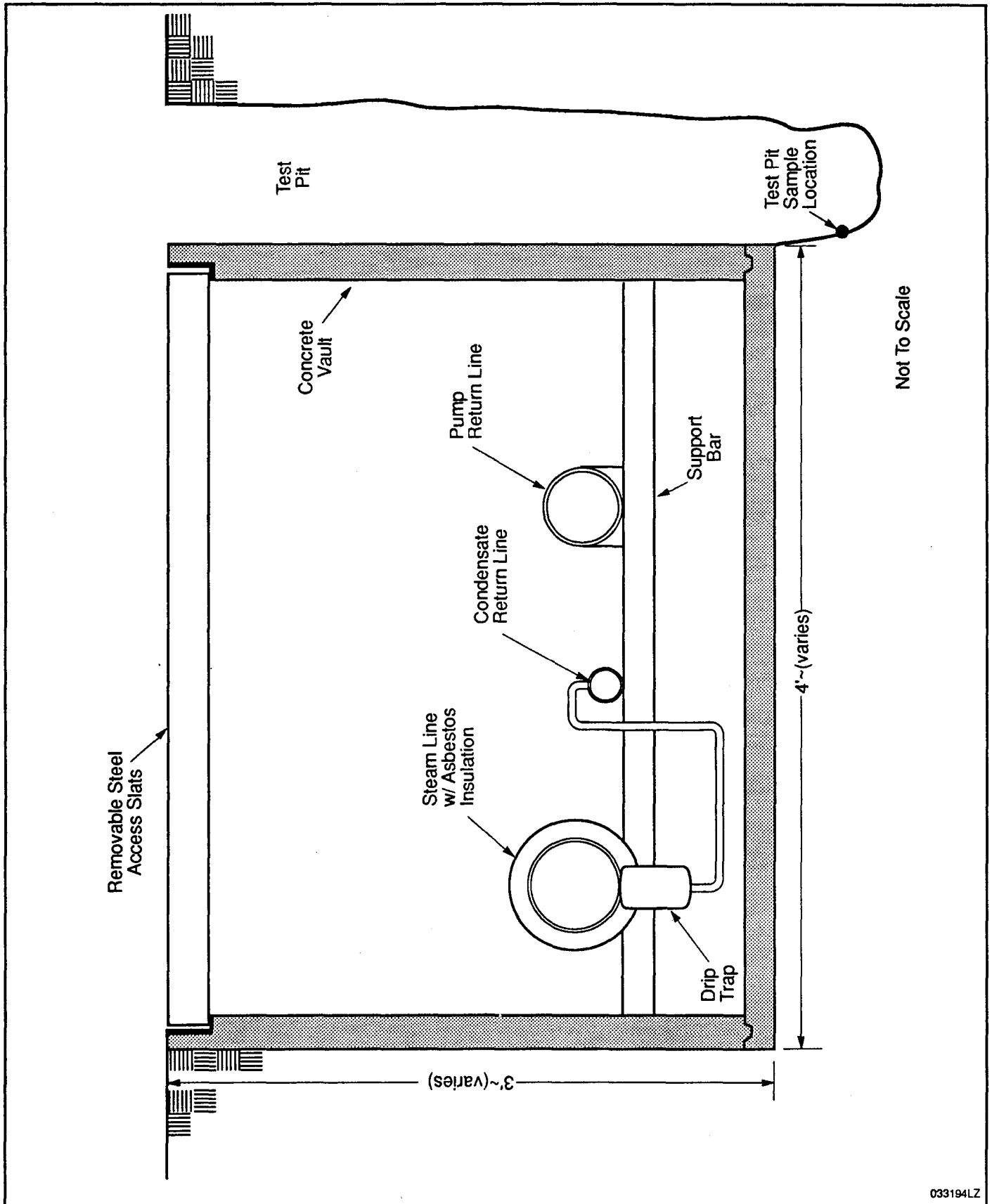
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JOB NUMBER  
11400 090502

APPROVED  
SKP

DATE  
12/93

REVISED DATE



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Environmental Services

**Typical Utilidor Cross Section, PA-45, Steam Lines**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

PLATE

**7**

DRAWN  
SRSc

JOB NUMBER  
11400 090502

APPROVED  
WWM

DATE  
9/93

REVISED DATE

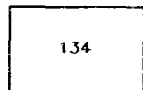
# EXPLANATION:

## SI INSPECTION/SAMPLING LOCATIONS


 PA45ST208 STEAMLINE INSPECTION

 PA45ST201 STEAMLINE INSPECTION AND BORESCOPE

 UTILIDOR ACCESS

 134 EXISTING BUILDING

 EXISTING IR SITE

 EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION


 155 LOCATION OF FORMER BUILDING

 IR SITE BOUNDARY


 PA SITE BOUNDARY


 PARCEL BOUNDARY

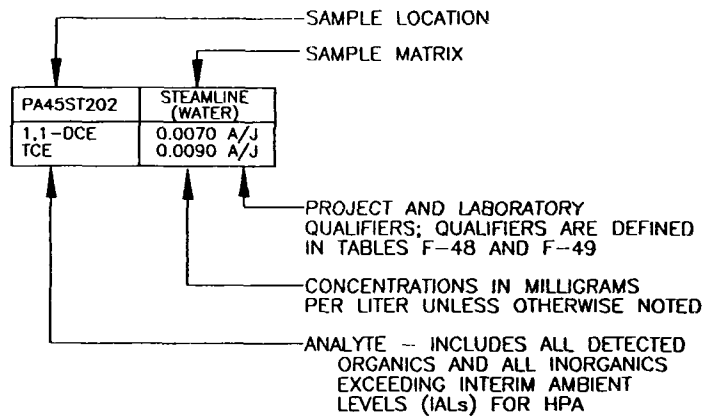
 RAILROAD TRACKS

 FENCE

 EXTENT OF STEAMLINE NETWORK PER CONTROL DIAGRAM\* AS VERIFIED BY FIELD OBSERVATIONS

 EXTENT OF STEAMLINE NETWORK BASED ON CONTROL DIAGRAM\*, NOT INVESTIGATED AS PART OF THE SI




 POSSIBLE REMOVED STEAMLINE SECTIONS BASED ON FIELD OBSERVATIONS AND/OR ADJACENT SITE DEMOLITION







ms/l = MILLION STRUCTURES PER LITER

## KEY TO HEALTH RISK NOTATION SYSTEM

### RECEPTOR

-  CHILD RESIDENT
-  ADULT RESIDENT
-  COMMERCIAL WORKER

### RISK LEVEL/TYPE

- ORANGE  EXCEEDS 10-4 HBLc
- YELLOW  EXCEEDS 10-5 HBLc
- BLUE  EXCEEDS 10-6 HBLc
-  EXCEEDS HBLn

## NOTES:

\*1948, SAN FRANCISCO NAVAL SHIPYARD, CONTROL DIAGRAM, STEAM AND CONDENSATE LINES (PW DRAWING NO. 16013-137)



**Harding Lawson Associates**

Engineering and  
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**Key to PA-45, Parcel B Steam Line Map** PLATE

Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

**8A**

DRAWN  
DEK

JOB NUMBER  
11400 090502

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WWM

DATE  
12/93

REVISED DATE

HPAN0538 1.0 FOR: HPAN0537  
19940411.0759

INDIA BASIN

SEE PLATE 8A  
FOR EXPLANATION

PA45ST202	STEAMLINE (WATER)	PUMP RETURN (WATER)
1,1-DCE	0.0070 A/J	
TCE	0.0090 A/J	
Benzene	0.041 A	
4M2pentanone	0.021 A	
Toluene	0.11 A	
Chlorobenzene	0.014 A/J	
Ethylbenzene	0.014 A/J	
Xylenes	0.26 A	
Noncarc PAHs	0.27	
Phenols	0.19 A/J	
4-Mphenol	0.13 A/J	
2,4-Dmphenol	0.13 A/J	
TPH-Diesel	9.7 A	
TPH-Gasoline	3.2 A	
TPH-Ttl Recv	2.9 A	
Ba	2.76942 A	
K	224.536 A	
Na	5718.73 A	
Ttl Asbes (ms/l)	3.0 A	

0 200 400  
SCALE IN FEET



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**Analytical Results, PA-45, Parcel B Steam Lines** PLATE  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

**8B**




DRAWN CSN JOB NUMBER 11400 090502


APPROVED WWM DATE 11/93 REVISED DATE

HPAN0537 200.0  
118940406-1215

# EXPLANATION:


## SI INSPECTION/SAMPLING LOCATIONS

-  PA45ST308 STEAMLINE INSPECTION
-  PA45ST306 STEAMLINE INSPECTION AND BORESCOPE
-  PA45TA18 TEST PIT; SYMBOL DOES NOT REPRESENT TRUE LENGTH OF TEST PIT

 UTILIDOR ACCESS

 369 EXISTING BUILDING

 EXISTING IR SITE

 EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION


 IR SITE BOUNDARY


 PA SITE BOUNDARY

 PARCEL BOUNDARY

 RAILROAD TRACKS

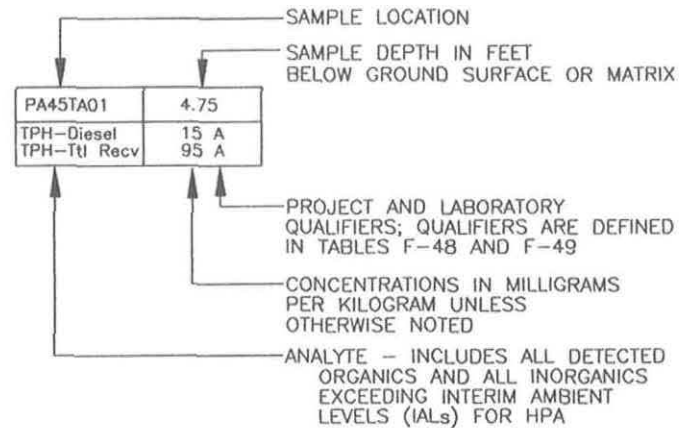
 FENCE

 EXTENT OF STEAMLINE NETWORK PER CONTROL DIAGRAM\* AS VERIFIED BY FIELD OBSERVATIONS

 EXTENT OF STEAMLINE NETWORK BASED ON CONTROL DIAGRAM\*, NOT INVESTIGATED AS PART OF THE SI

 OIL PRESENT IN STEAMLINE




 OIL PRESENT IN STEAMLINE AND/OR UTILIDOR



ms/l = MILLION STRUCTURES PER LITER

## KEY TO HEALTH RISK NOTATION SYSTEM

### RECEPTOR

-  CHILD RESIDENT
-  ADULT RESIDENT
-  COMMERCIAL WORKER

### RISK LEVEL/TYPE

- ORANGE  EXCEEDS 10-4 HBLc
- YELLOW  EXCEEDS 10-5 HBLc
- BLUE  EXCEEDS 10-6 HBLc
-  EXCEEDS HBLn

## NOTES:

-  STEAMLINE UTILIDORS ARE INACCESSIBLE IN THIS AREA DUE TO PAVEMENT OVERLAYS ALONG SOUTHERN END OF DRYDOCK 4.

\*1948, SAN FRANCISCO NAVAL SHIPYARD, CONTROL DIAGRAM, STEAM AND CONDENSATE LINES (PW DRAWING NO. 16013-137)

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**Key to PA-45, Drydock 4 Area Steam Line Map** <sup>PLATE</sup>  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

**9A**

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INDIA BASIN

# EXPLANATION:

## SI SAMPLING LOCATIONS

PA46TA11

TEST PIT; SYMBOL DOES NOT REPRESENT

LOCATION OF NEW FUEL LINES

LOCATION OF ABANDONED FUEL LINES

LOCATION OF UTILIDOR WITH ABANDONED LUBE OIL LINES

SUSPECTED FUEL LINE; CONFIRMED NOT PRESENT

130

EXISTING BUILDING

EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION

EXISTING IR SITE

155

LOCATION OF FORMER BUILDING

IR SITE BOUNDARY

PA SITE BOUNDARY

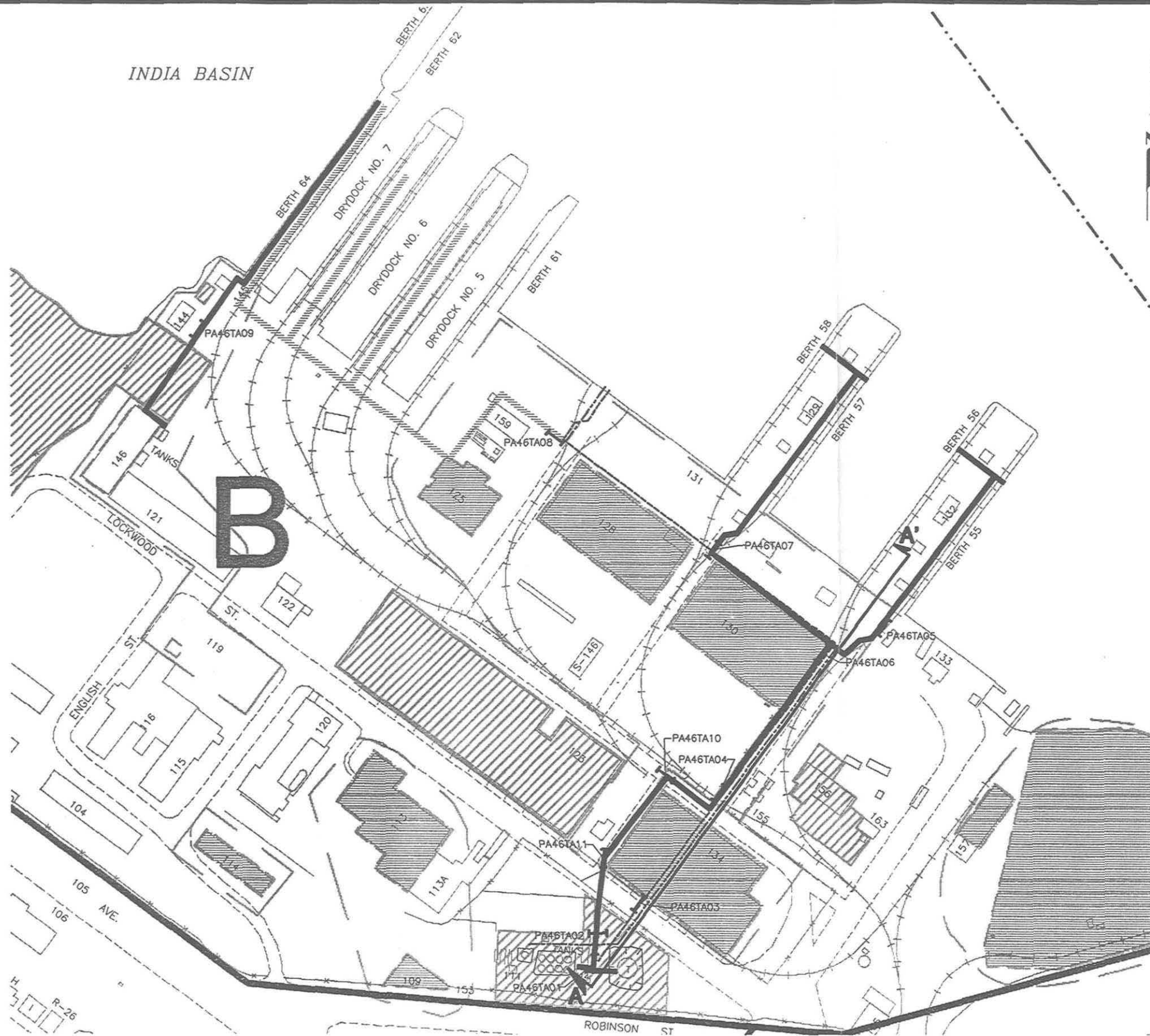
PARCEL BOUNDARY

RAILROAD TRACKS

FENCE

A A'

LINE OF LITHOLOGIC CROSS SECTION SEE PLATE 14



0 200 400  
SCALE IN FEET



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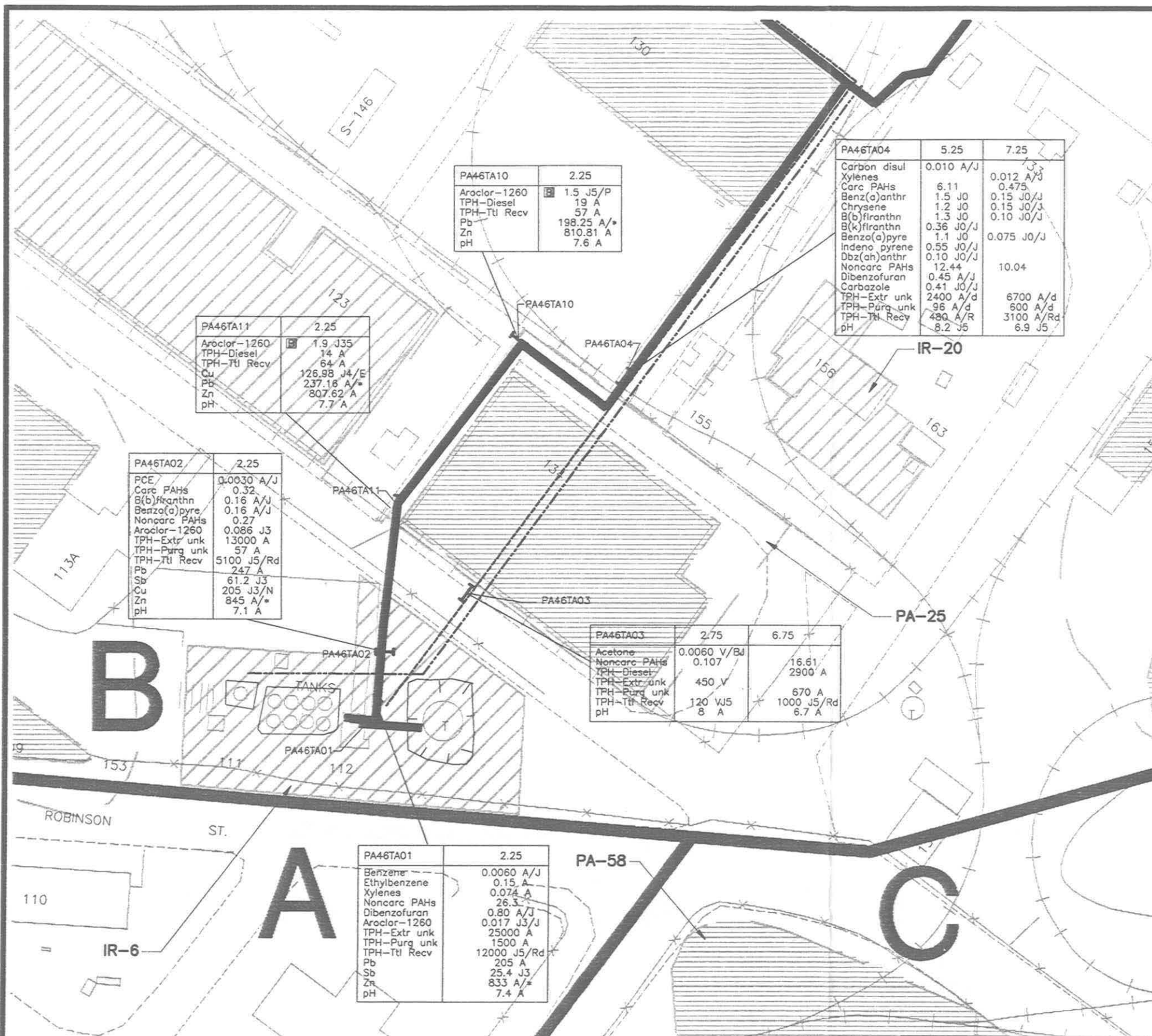
**Site Map, PA-46, Fuel Lines**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

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DATE 12/93

PLATE

**10**

REVISED DATE



# EXPLANATION:

## SI SAMPLING LOCATIONS

PA46TA01

TEST PIT; SYMBOL DOES NOT REPRESENT TRUE LENGTH OF TEST PIT



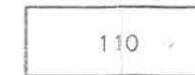
LOCATION OF NEW FUEL LINES



LOCATION OF ABANDONED FUEL LINES



LOCATION OF UTILIDOR WITH ABANDONED LUBE OIL LINES



EXISTING BUILDING



EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION



EXISTING IR SITE



LOCATION OF FORMER BUILDING



IR SITE BOUNDARY



PA SITE BOUNDARY



PARCEL BOUNDARY



RAILROAD TRACKS



FENCE



SAMPLE LOCATION



SAMPLE DEPTH IN FEET BELOW GROUND SURFACE

PA46TA10	2.25
Aroclor-1260	1.5 J5/P
TPH-Diesel	19 A
TPH-Ttl Recv	57 A
Pb	198.25 A/*
Zn	810.81 A

PROJECT AND LABORATORY QUALIFIERS; QUALIFIERS ARE DEFINED IN TABLES F-48 AND F-49

CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM UNLESS OTHERWISE NOTED

ANALYTE - INCLUDES ALL DETECTED ORGANICS AND ALL INORGANICS EXCEEDING INTERIM AMBIENT LEVELS (IALs) FOR HPA

## KEY TO HEALTH RISK NOTATION SYSTEM

### RECEPTOR



CHILD RESIDENT



ADULT RESIDENT



COMMERCIAL WORKER

### RISK LEVEL/TYPE



EXCEEDS 10-4 HBLc



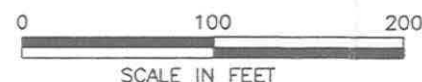
EXCEEDS 10-5 HBLc



EXCEEDS 10-6 HBLc



EXCEEDS HBLn



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**Analytical Results, PA-46, Fuel Lines, Southern Section** PLATE  
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Naval Station Treasure Island  
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11

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## EXPLANATION:

## SI SAMPLING LOCATIONS

- PA24B002 SOIL BORING  
 PA24AW02A A-AQUIFER MONITORING WELL  
 PA46TA01 TEST PIT; SYMBOL DOES NOT REPRESENT TRUE LENGTH OF TEST PIT  
 LOCATION OF NEW FUEL LINES  
 LOCATION OF ABANDONED FUEL LINES  
 LOCATION OF UTILIDOR WITH ABANDONED LUBE OIL LINES  
 SUSPECTED FUEL LINE; CONFIRMED NOT PRESENT  
 EXISTING BUILDING  
 EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION  
 EXISTING IR SITE  
 LOCATION OF FORMER BUILDING  
 IR SITE BOUNDARY  
 PA SITE BOUNDARY  
 RAILROAD TRACKS  
 FENCE  
 SAMPLE LOCATION  
 SAMPLE DEPTH IN FEET BELOW GROUND SURFACE

PROJECT AND LABORATORY QUALIFIERS;  
QUALIFIERS ARE DEFINED IN TABLES F-48 AND F-49

CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM  
UNLESS OTHERWISE NOTED

ANALYTE - INCLUDES ALL DETECTED ORGANICS AND  
ALL INORGANICS EXCEEDING INTERIM  
AMBIENT LEVELS (IALs) FOR HPA

## KEY TO HEALTH RISK NOTATION SYSTEM

## RECEPTOR

- A CHILD RESIDENT  
 B ADULT RESIDENT  
 C COMMERCIAL WORKER

## RISK LEVEL/TYPE

- ORANGE EXCEEDS 10-4 HBLc  
 YELLOW EXCEEDS 10-5 HBLc  
 BLUE EXCEEDS 10-6 HBLc  
 EXCEEDS HBLn

PA24MW02A	2.25	4.25	6.75	9.25	11.75
Carbon disul	0.0020 A/J			0.0020 A/J	
Xylenes	0.40				
Noncarc PAHs	250 A		110 A	1300 A	330 V
TPH-Extr unk					1.4 V/d
TPH-Purg unk	32000 A	110 A		1100 A	230 V
TOG	22.6 J2/A				
Pb	8.1 J5	7.8 J5		7.7 J5	8.1 V J5
pH					

PA46TA08	2.75
Corc PAHs	2.39754
Benz(a)anthr	0.40481 A
Chrysene	0.51666 A
B(b)flanthn	0.53995 A
B(k)flanthn	0.44482 A
Benzo(a)pyre	0.4913 A
Noncarc PAHs	2.09895 A
b(2EH)phthal	0.17161 A/J
TPH-Diesel	12 A
pH	9.1 A

PA24B002	2.25	4.25	6.75	9.25
Toluene			0.04831 A	
Ethylbenzene			0.01373 A	
Xylenes			0.07087 A	
Aroclor-1260			0.13 J3	
TPH-Diesel	58 J3	39 A	140 A	32 A
TOG	320 A	72 A	21000 A	85 A
pH	8.4 A	8.8 A	8.8 A	8.6 A

PA24B004	2.25	4.25	6.75	9.25	11.75
Carbon disul	0.00561 VJ/J				
4M2pentanone	0.0055 V/J	0.00653 J7/J			
Xylenes	0.54692				
Noncarc PAHs	1.4 VJ3				
Aroclor-1260	92 V				
TPH-Diesel		28 A	24 A	28 A	4800 A
TPH-Gasoline	27000 V	160 A	180 A	80 A	7500 A
TOG					5777 A
Na	8.3 V	8.2 A	8.2 A	8.3 A	9.5 A
pH					

PA24B006	2.25	4.25
4M2pentanone		0.05818 J7
2-Hexanone		0.0358 J7
Toluene		0.00546 A/J
Ethylbenzene		0.00367 A/J
Xylenes		0.01616 A
TPH-Diesel	74 A	1100 A
TOG	31000 A	58000 A
Pb	36.62 J3/N	
Cu	115.38 A	
pH	8.1 A	8.6 A

PA24B008	2.25	4.25	6.75
TPH-Diesel	51 A		
Pb	16.1 J2/A		
pH	8.3 J5	8.5 J5	8.3 J5
Chrysotile Asbestos		2.0 A	2.0 A

PA46TA10	2.25
Aroclor-1260	1.5 J5/P
TPH-Diesel	19 A
TPH-Ttl Recv	57 A
Pb	198.25 A/A
Zn	810.81 A
pH	7.6 A

PA46TA07	2.25
Xylenes	0.0041 A/J
Aroclor-1260	0.42 A
TPH-Diesel	35 A
pH	8.4 A

PA24MW03A	2.25	4.25	6.25	8.25	11.75	16.75
Carbon disul			0.0020 A/BJ		0.0070 A/J	0.0080 A/J
Corc PAHs	7.8					
Chrysene	7.8 A					
Noncarc PAHs	0.60					
Phenols	3.5 A/BJ					
TPH-Diesel			76 A			
TPH-Extr unk	58 A	18 A		290 V	8100 A	7500 A
TPH-Purg unk					240 A	200 A
TOG						2500 J25
Pb	41.8 A/S	20 A/S				
Cu		537 J3/N				
Mn		3550 J3/N				
pH	7.4 A	7.7 A	6.8 A	8.2 A	8.5 A	8.3 A

PA46TA05	3.75	10.25
Corc PAHs	0.224	
Benz(a)anthr	0.051 A/J	
Chrysene	0.059 A/J	
B(b)flanthn	0.074 A/J	
Benzo(a)pyre	0.040 A/J	
Noncarc PAHs	0.114	0.097
TPH-Extr unk	58 A/d	6100 A/d
TPH-Purg unk	59 A	59 A/d
TPH-Ttl Recv		1200 A/R
Na		7270 A
V		139 A
pH	8.2 J5	6.8 J5

PA46TA06	4.25	9.75
TPH-Diesel	31 A	1400 A
TPH-Gasoline	9.8 A	1100 A
pH		9.4 A

PA46TA04	5.25	7.25
Carbon disul	0.010 A/J	0.012 A/J
Xylenes	6.11	0.475
Corc PAHs	1.5 J0	0.15 J0/J
Benz(a)anthr	1.2 J0	0.15 J0/J
Chrysene	1.3 J0	0.10 J0/J
B(b)flanthn	0.36 J0/J	
B(k)flanthn	1.1 J0	0.075 J0/J
Benzo(a)pyre	0.55 J0/J	
Indeno pyrene	0.10 J0/J	
Obz(ah)anthr	12.44	10.04
Noncarc PAHs	0.45 A/J	
Dibenzofuran	0.41 J0/J	
Carbazole	2400 A/d	6700 A/d
TPH-Extr unk	96 A/d	600 A/d
TPH-Purg unk	8.2 J5	6.9 J5
pH		

0 100 200  
SCALE IN FEET



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**Analytical Results, PA-46, Fuel Line, Central Section**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

APPROVED WSM  
DATE 12/93  
REVISED DATE

INDIA BASIN

PA46TA09	3.25
TPH-Diesel	21 V
Pb	20.9 V
pH	8.5 V

PA46TA08	2.75
Carc PAHs	2.39754
Benz(a)anthr	0.40481 A
Chrysene	0.51666 A
B(b)flronthn	0.53995 A
B(k)flronthn	0.44482 A
Benzo(a)pyre	0.4913 A
Noncarc PAHs	2.09895
b(2Eh)phthal	0.17161 A/J
TPH-Diesel	12 A
pH	9.1 A

# EXPLANATION:

## RI SAMPLING LOCATIONS

IR07B034 SOIL BORING

## SI SAMPLING LOCATIONS

PA46TA08 TEST PIT; SYMBOL DOES NOT REPRESENT TRUE LENGTH OF TEST PIT

LOCATION OF NEW FUEL LINES  
LOCATION OF ABANDONED FUEL LINES  
LOCATION OF UTILIDOR WITH ABANDONED LUBE OIL LINES

SUSPECTED FUEL LINE; CONFIRMED NOT PRESENT

148 EXISTING BUILDING

EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION

EXISTING IR SITE

IR SITE BOUNDARY

PA SITE BOUNDARY

RAILROAD TRACKS

FENCE

SAMPLE LOCATION  
SAMPLE DEPTH IN FEET BELOW GROUND SURFACE

PA46TA09	3.25
TPH-Diesel	21 V
Pb	20.9 V

PROJECT AND LABORATORY QUALIFIERS;  
QUALIFIERS ARE DEFINED IN TABLES F-48 AND F-49

CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM  
UNLESS OTHERWISE NOTED

ANALYTE - INCLUDES ALL DETECTED ORGANICS AND  
ALL INORGANICS EXCEEDING INTERIM  
AMBIENT LEVELS (IALs) FOR HPA

## KEY TO HEALTH RISK NOTATION SYSTEM

RECEPTOR  
[A] CHILD RESIDENT  
[B] ADULT RESIDENT  
[C] COMMERCIAL WORKER

RISK LEVEL/TYPE  
ORANGE EXCEEDS 10-4 HBLc  
YELLOW EXCEEDS 10-5 HBLc  
BLUE EXCEEDS 10-6 HBLc  
[ ] EXCEEDS HBLn

0 100 200  
SCALE IN FEET



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**Analytical Results, PA-46, Fuel Lines, Northern Section** PLATE  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

13

DRAWN DEK  
JOB NUMBER 11400 090502

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DATE 12/93  
REVISED DATE

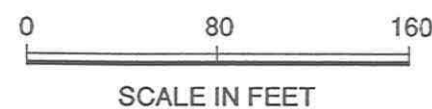
HPAN0542 100.0  
10040401.0818



**EXPLANATION**

- Zone of Petroleum Hydrocarbon Contamination in Soil; Queried Where Uncertain
- Approximate Location of Fuel Line
- Groundwater Level in Monitoring Well, Measured 8/16/93
- Qaf Artificial Fill
- MSL Mean Sea Level
- HP Proposed Hydropunch Sample Location

See plate 10 for location of Cross Section A-A'



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PMc

JOB NUMBER  
11400 090502

**Geologic Cross Section A-A', PA-46, Fuel Lines**  
Parcel B Site Inspection Report  
Hunters Point Annex  
Naval Station Treasure Island  
San Francisco, California

APPROVED  
WWM

DATE  
10/93

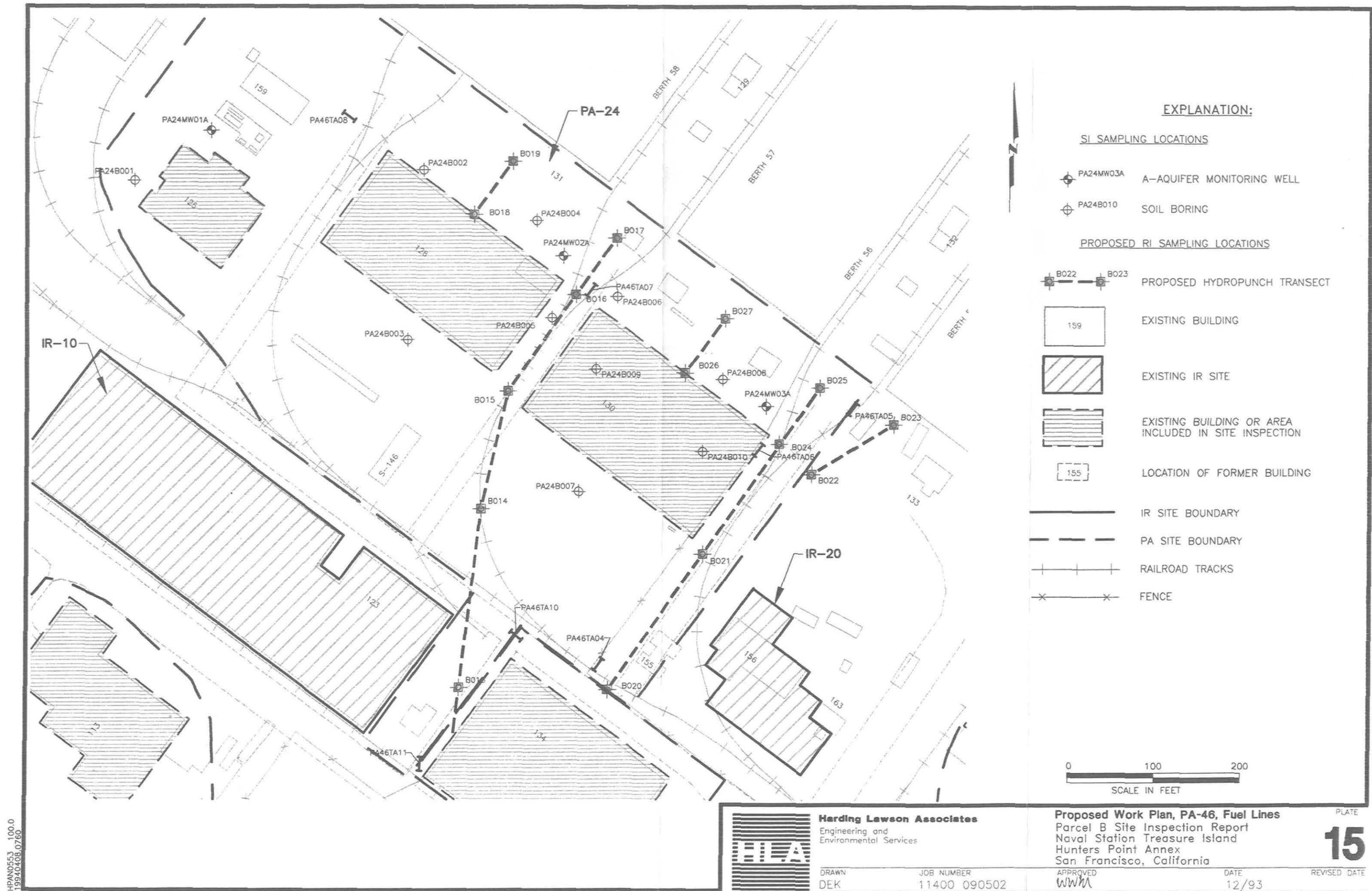
REVISED DATE

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PLATE

**14**





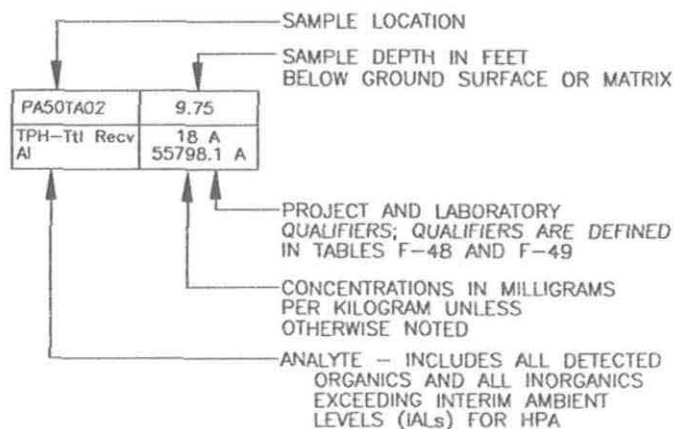
# EXPLANATION\*:

## SI INSPECTION/SAMPLING LOCATIONS

- PA28B044 SOIL BORING
- PA49TA06 TEST PIT; SYMBOL DOES NOT REPRESENT TRUE LENGTH OF TEST PIT
- PA50SW307 STORM DRAIN MANHOLE
- PA50CB300 CATCH BASIN
- PA50FC212 FLOOD CONTROL GATE
- PA50SW309 SEDIMENT SAMPLE LOCATION
- PA26SS07 SURFACE SOIL SAMPLE
- PA26SB06 SANDBLAST MATERIAL

- 369 EXISTING BUILDING
- EXISTING IR SITE
- EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- 155 LOCATION OF FORMER BUILDING

- IR SITE BOUNDARY
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS
- FENCE
- 1935 1935 SHORELINE
- STORM DRAIN LINE, ARROW INDICATES DIRECTION OF FLOW. QUERIED WHERE PRESENCE UNCERTAIN.
- STORM DRAIN LINE WHERE VIDEO LOG ATTEMPT WAS SUCCESSFUL
- STORM DRAIN LINE WHERE VIDEO LOG ATTEMPT WAS UNSUCCESSFUL
- APPROXIMATE LOCATION WHERE BOTTOM OF STORM DRAIN PIPE INTERSECTS GROUNDWATER. ARROWS ON DOWN SLOPE SIDE.
- EXTENT OF TIDAL INTRUSION IN STORM DRAIN.
- (B1) INDEX TO VIDEO RECORD; SEE TABLE 9.



## KEY TO HEALTH RISK NOTATION SYSTEM

- RECEPTOR
  - A CHILD RESIDENT
  - B ADULT RESIDENT
  - C COMMERCIAL WORKER
- RISK LEVEL/TYPE
  - ORANGE EXCEEDS 10-4 HBLc
  - YELLOW EXCEEDS 10-5 HBLc
  - BLUE EXCEEDS 10-6 HBLc
  - EXCEEDS HBLn

\* APPLIES TO PLATES 16B - 21.

HPAN0614 1.0 FOR: HPAN0545  
19940413.0836



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**Key to PA-50, Storm Drain Line Maps** PLATE  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

**16A**



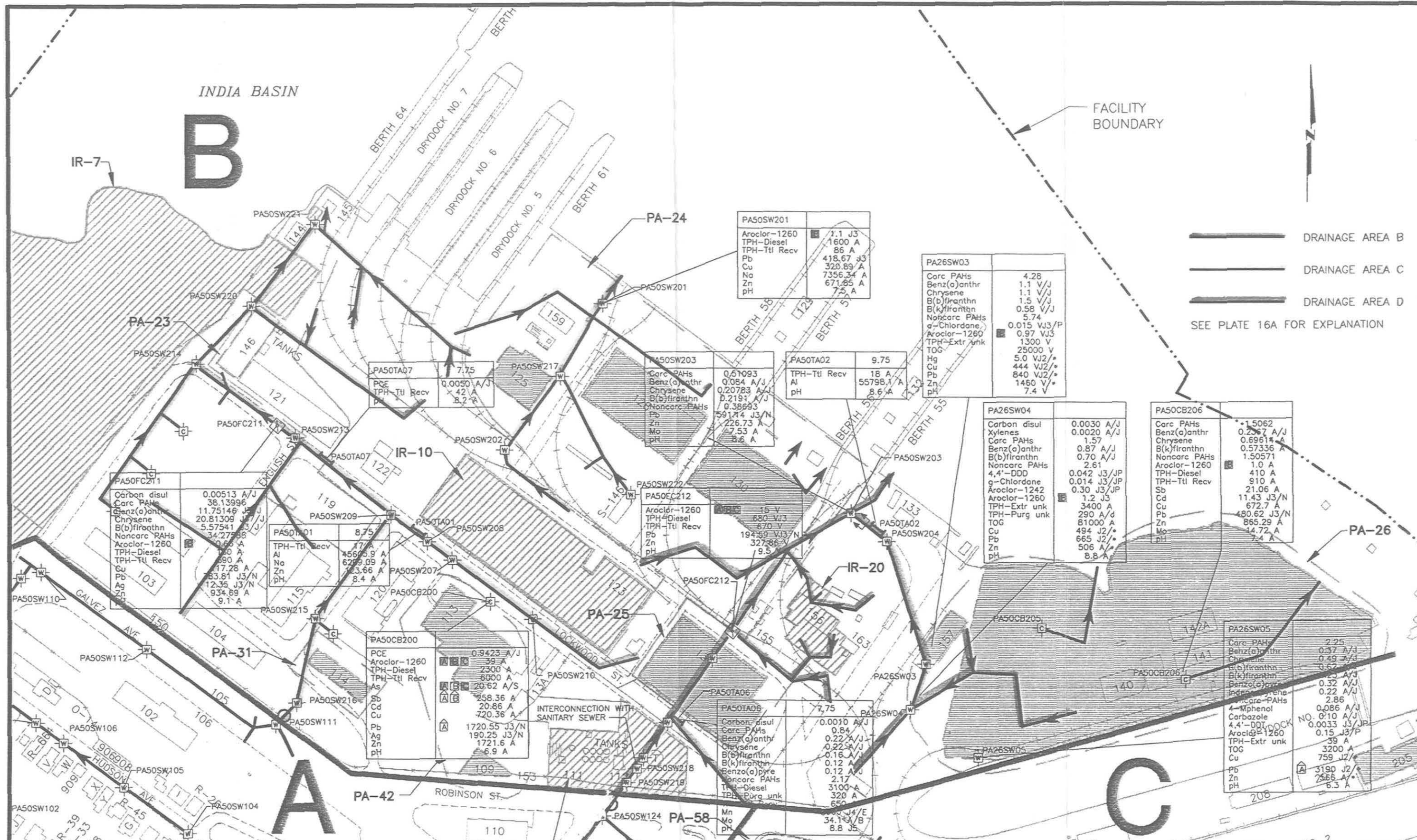


INDIA BASIN

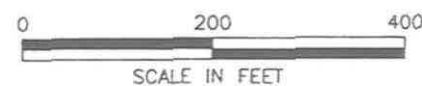
B

FACILITY  
BOUNDARY

— DRAINAGE AREA B  
— DRAINAGE AREA C  
— DRAINAGE AREA D  
SEE PLATE 16A FOR EXPLANATION



1140034, 200.0  
19840413.1257



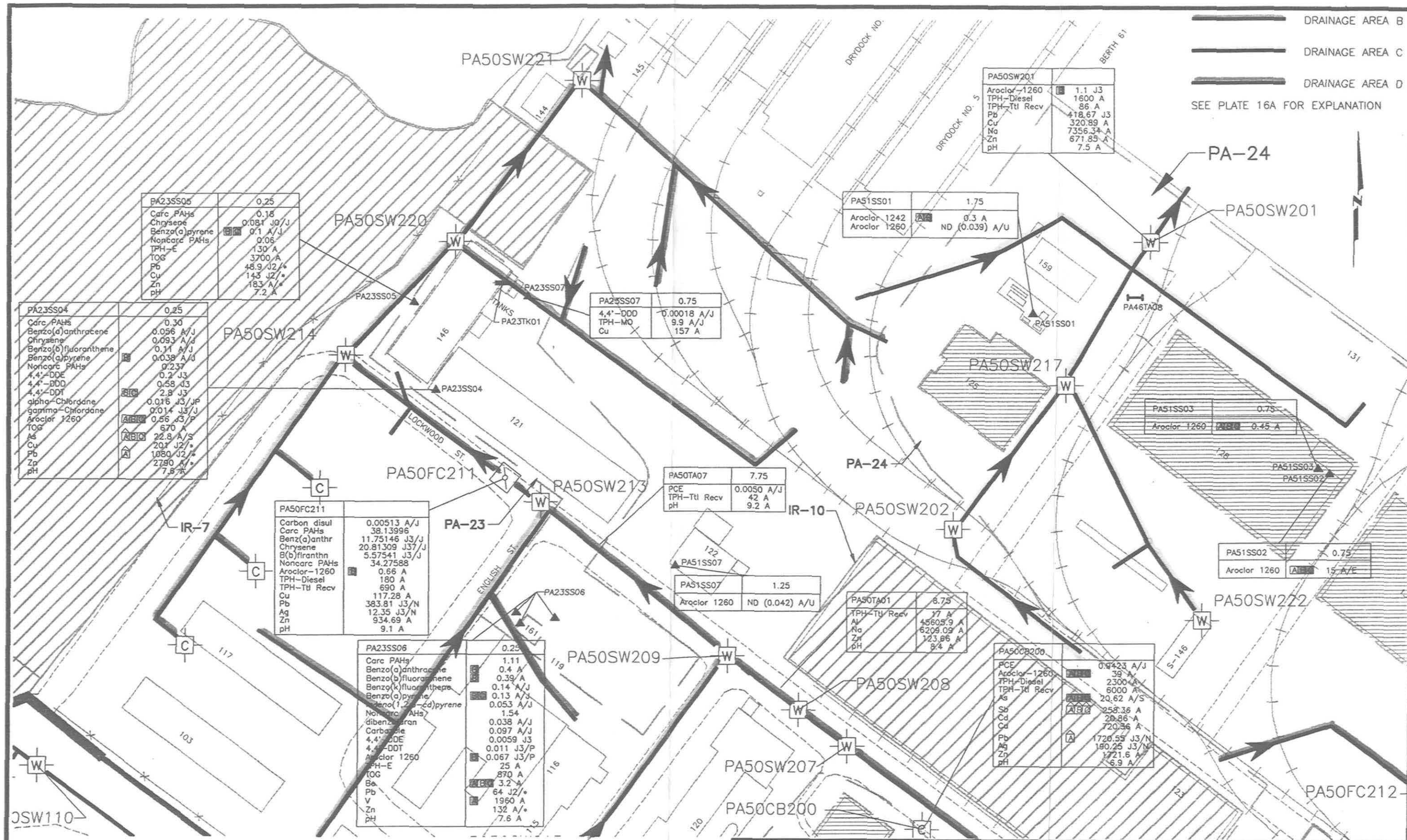
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Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
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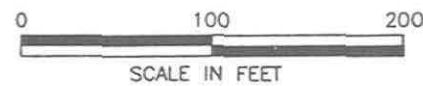
PLATE

**17**

DRAWN DEK	JOB NUMBER 11400 090502	APPROVED WJW	DATE 12/93	REVISED DATE
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— DRAINAGE AREA B  
— DRAINAGE AREA C  
— DRAINAGE AREA D  
SEE PLATE 16A FOR EXPLANATION

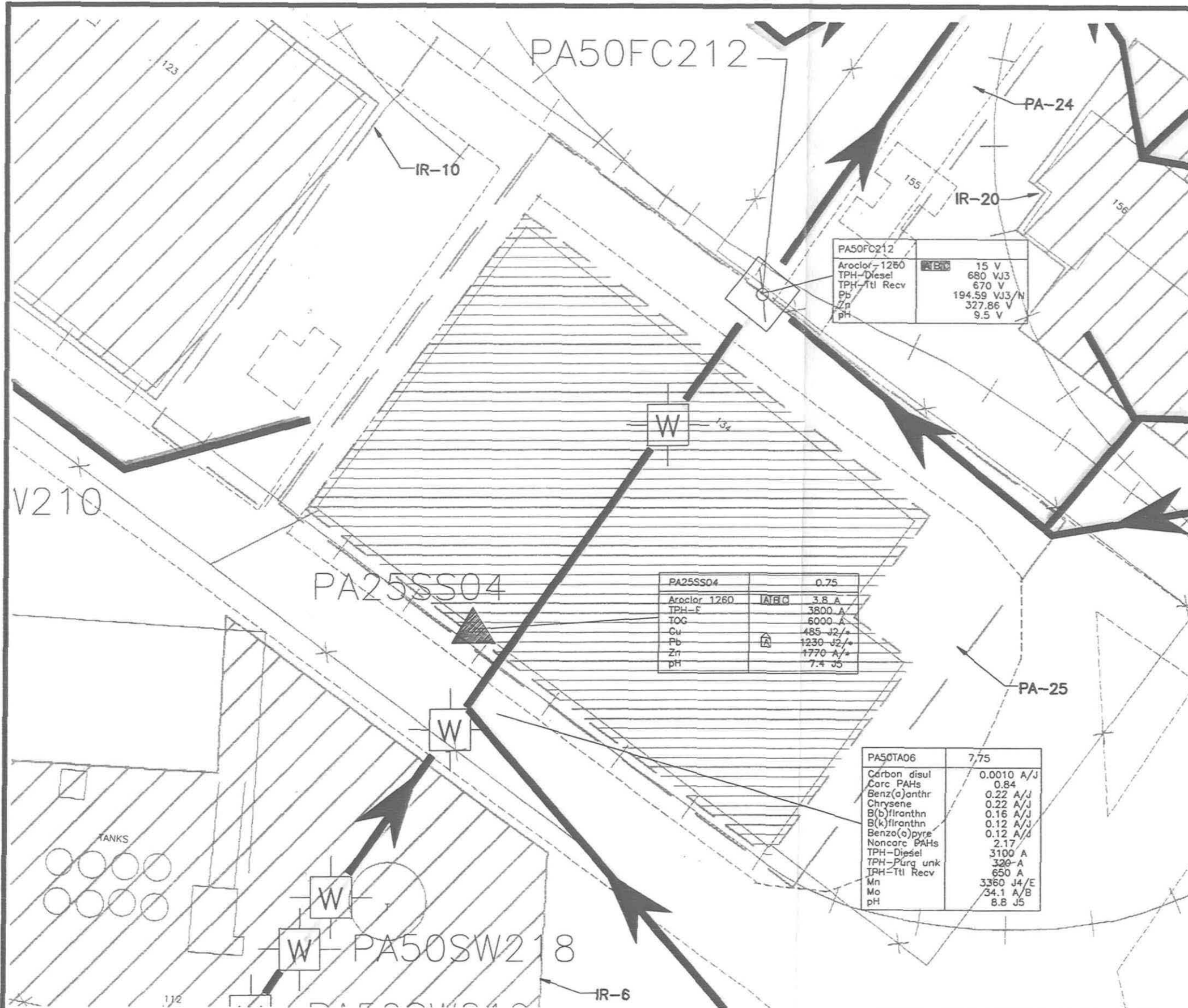


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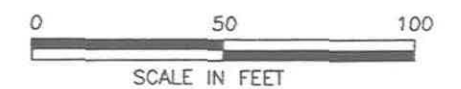
**Analytical Results, PA-50, Storm Drains Near PA-23**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

HPAN0547 100.0  
19940413.0926





— DRAINAGE AREA B  
 — DRAINAGE AREA D  
 SEE PLATE 16A FOR EXPLANATION



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**Analytical Results, PA-50, Storm Drains Near PA-25** PLATE  
 Parcel B Site Inspection Report  
 Naval Station Treasure Island  
 Hunters Point Annex  
 San Francisco, California

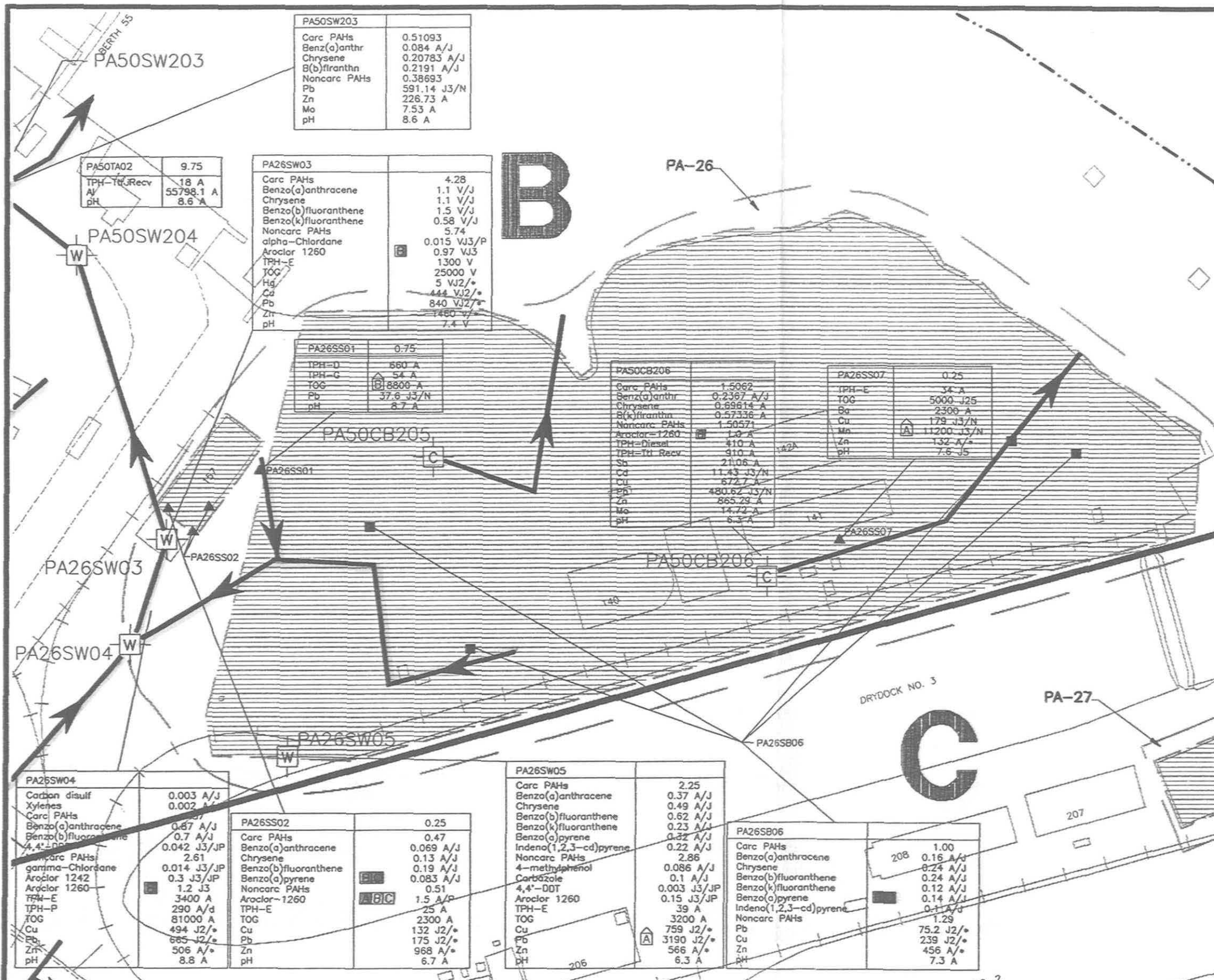
DRAWN  
 DEK

JOB NUMBER  
 11400 090502

APPROVED  
 WLM

DATE  
 12/93

REVISED DATE



DRAINAGE AREA D  
SEE PLATE 16A FOR EXPLANATION

0 100 200  
SCALE IN FEET

HPAN0549 100.0  
19940413.0944



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**Analytical Results, PA-50, Storm Drains Near PA-26**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

**20**

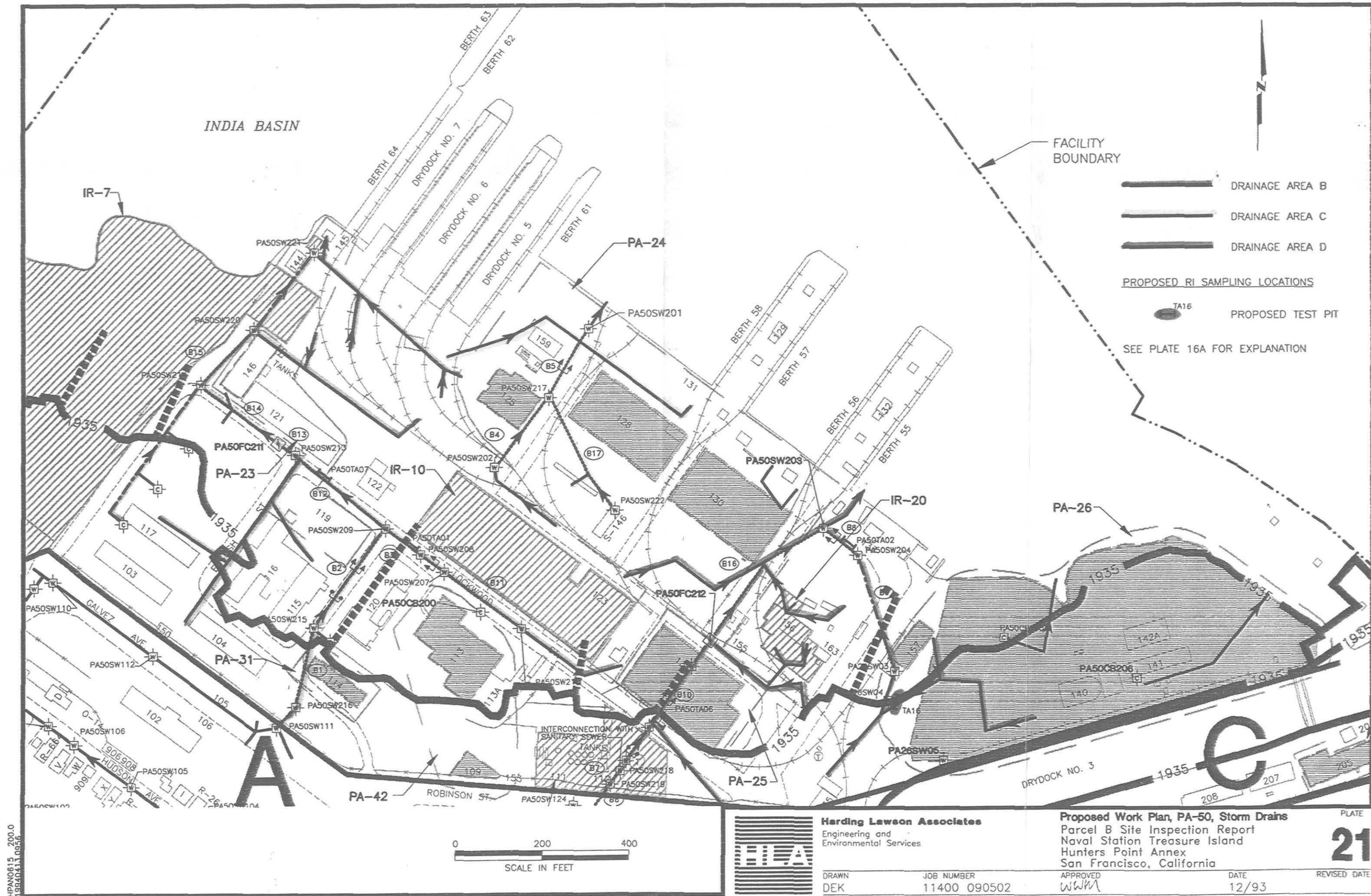
DRAWN DEK  
JOB NUMBER 11400 090502

APPROVED WWM

DATE 12/93

REVISED DATE





PA50SN201 (mg/kg)	Sediment
Aroclor-1260	6.9 J3
TPH-Tu Recv	150 A
Hg	25.25 A
Pb	202.58 J3
Cu	445.33 A
Ag	35.72 J3/N
Zn	167.05 A
pH	7.8 A

PA50SN206	Sewer Water
Toluene	0.0010 A/J
Ba	0.0388 A/B
Ca	146 J4/E
Fe	0.0677 A/B
Mg	469 A
Mn	0.0018 J4/EB
K	149 A
Na	4000 A

PA50SN235	Sewer Water
1,2-DCE	0.00443 A/J
TCE	0.00329 A/J
Hg	0.00013 A/B
As	0.00283 A/B
Pb	0.01504 J237/N++
Ti	0.04588 J3/BN
Al	0.03113 A/B
Sb	0.02368 A/B
Bo	0.06627 A/B
Cl	0.01298 A
Fe	0.07763 A/B
Mg	151.116 A
Mn	0.12231 A
K	33.0389 A
Na	783.54 A
V	0.00477 A/B
Zn	0.00635 A/B
Fec Coliform	1600 A

PA50MW02A	Groundwater
Organics	Not Detected
Inorganics	Below IALs

PA50MW34A	Groundwater
Nonpne PAHs	0.048
Dibenzofuran	0.0040 A/J

# EXPLANATION:

## SI SAMPLING LOCATIONS

- PA50SN206 SANITARY SEWER
- PA50B001 SOIL BORING
- PA50MW01A A-AQUIFER MONITORING WELL
- SANITARY SEWER LINE (WITH FLOW DIRECTION); DASHED WHERE APPROXIMATELY LOCATED; QUERIED WHERE UNCERTAIN (REACH 1, REACH 2, REACH 3, REACH 10)
- PUMP STA. #7 PUMP STATION
- 130 EXISTING BUILDING
- EXISTING IR SITE
- EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- 155 LOCATION OF FORMER BUILDING
- IR SITE BOUNDARY
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS
- FENCE
- 1935 1935 SHORELINE
- SAMPLE LOCATION
- SAMPLE MATRIX

PA50SN206	Sewer Water
Toluene	0.0010 A/J

PROJECT AND LABORATORY QUALIFIERS; QUALIFIERS ARE DEFINED IN TABLES F-48 AND F-49

CONCENTRATIONS IN MILLIGRAMS PER LITER UNLESS OTHERWISE NOTED  
ANALYTE - INCLUDES ALL DETECTED ORGANICS AND ALL INORGANICS EXCEEDING INTERIM AMBIENT LEVELS (IALs) FOR HPA

\* FECAL COLIFORM UNITS= MOST PROBABLE NUMBER PER 0.1 LITER.

## KEY TO HEALTH RISK NOTATION SYSTEM

- RECEPTOR
  - A CHILD RESIDENT
  - B ADULT RESIDENT
  - C COMMERCIAL WORKER
- RISK LEVEL/TYPE
  - ORANGE EXCEEDS 10-4 HBLc
  - YELLOW EXCEEDS 10-5 HBLc
  - BLUE EXCEEDS 10-6 HBLc
  - EXISTING HBLn

HPAN0550 250.0  
19940413.1100

0 250 500  
SCALE IN FEET



**Harding Lawson Associates**  
Engineering and  
Environmental Services

DRAWN DEK JOB NUMBER 11400 090502

**Analytical Results, PA-50, Sanitary Sewer**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

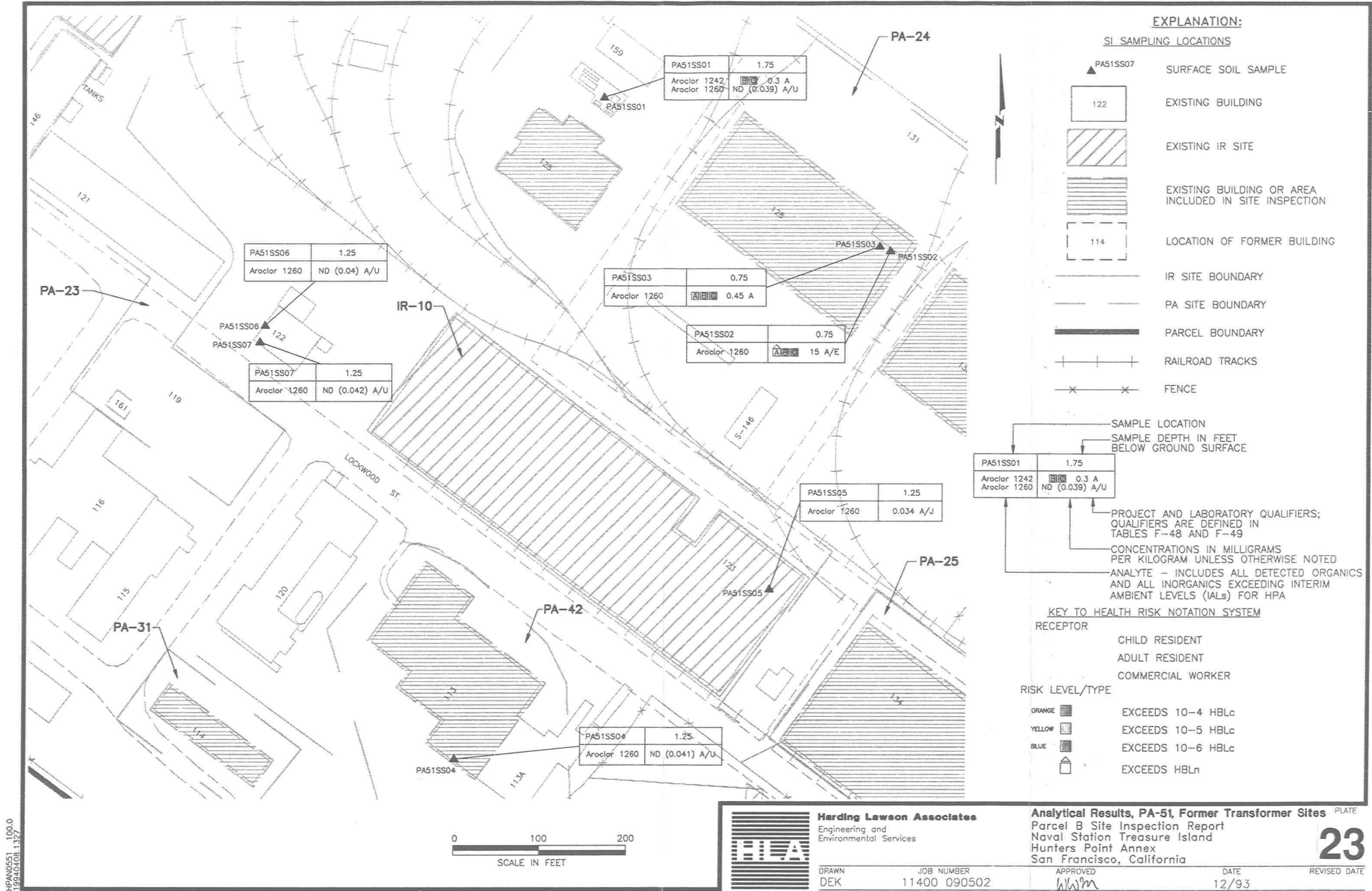
APPROVED WWM DATE 12/93

PLATE

22

REVISED DATE







HPAN0554 - 100.0  
19940408 1347

	<b>Harding Lawson Associates</b> Engineering and Environmental Services		<b>Proposed Work Plan, PA-51, Former Transformer Sites</b> <small>PLATE</small> Parcel B Site Inspection Report Naval Station Treasure Island Hunters Point Annex San Francisco, California		<b>24</b> <small>REVISED DATE</small>
	<small>DRAWN</small> DEK	<small>JOB NUMBER</small> 11400 090502	<small>APPROVED</small> WWM	<small>DATE</small> 12/93	



# EXPLANATION:

## SI SAMPLING LOCATIONS

- PA23SS07 SURFACE SOIL SAMPLE
- 159 EXISTING BUILDING
- EXISTING IR SITE
- EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- IR SITE BOUNDARY
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS
- FENCE

SAMPLE LOCATION  
SAMPLE DEPTH IN FEET  
BELOW GROUND SURFACE

PA23SS07	0.75
4,4'-DDD	0.00018 A/J
TPH-Mtr Oil	9.9 A/J
Cu	157 A

PROJECT AND LABORATORY QUALIFIERS;  
QUALIFIERS ARE DEFINED IN  
TABLES F-48 AND F-49

CONCENTRATIONS IN MILLIGRAMS  
PER KILOGRAM UNLESS OTHERWISE NOTED  
ANALYTE - INCLUDES ALL DETECTED ORGANICS  
AND ALL INORGANICS EXCEEDING INTERIM  
AMBIENT LEVELS (IALs) FOR HPA

## KEY TO HEALTH RISK NOTATION SYSTEM

- RECEPTOR
- A CHILD RESIDENT
  - B ADULT RESIDENT
  - C COMMERCIAL WORKER

## RISK LEVEL/TYPE

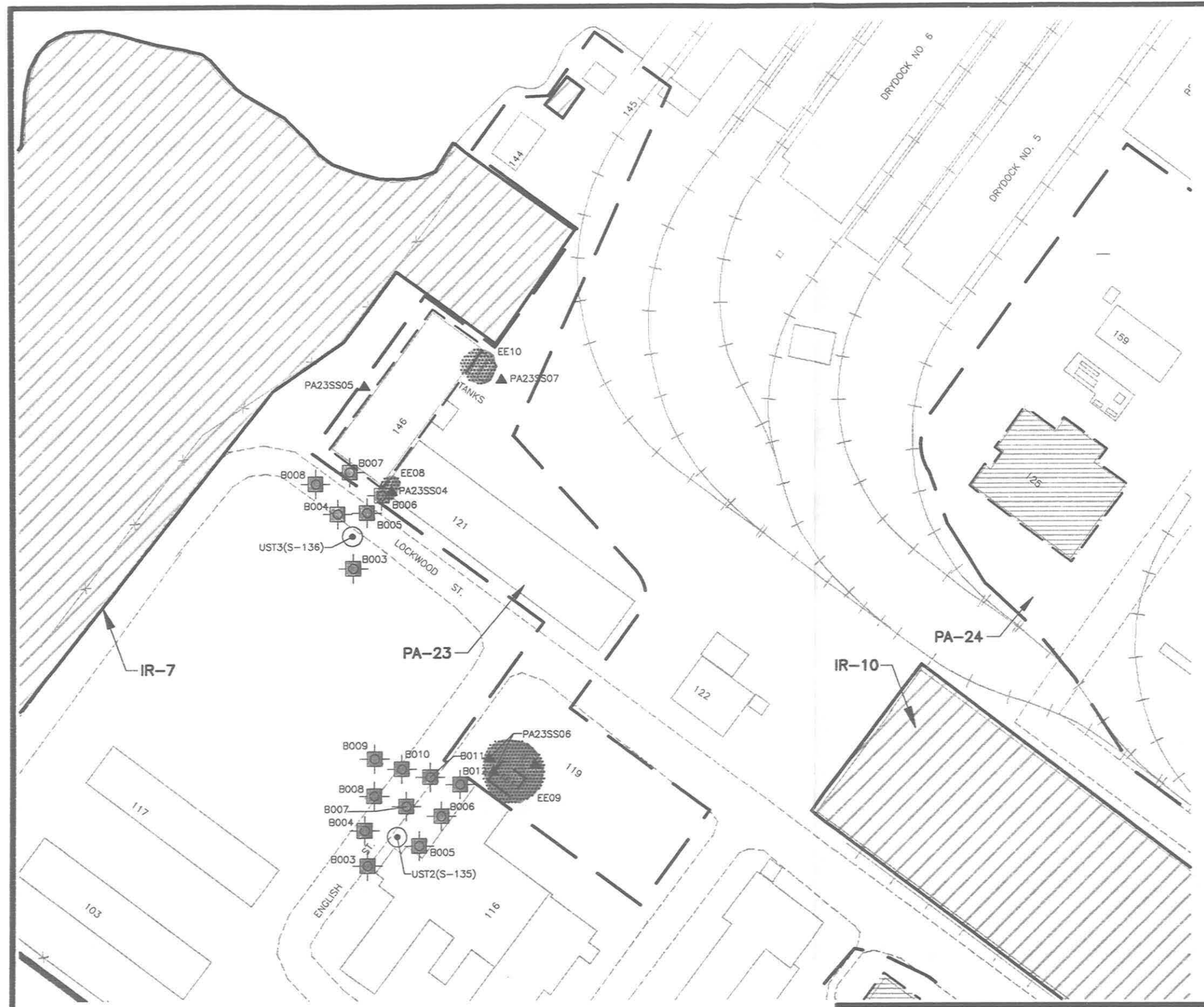
- ORANGE EXCEEDS 10-4 HBLc
- YELLOW EXCEEDS 10-5 HBLc
- BLUE EXCEEDS 10-6 HBLc
- EXCEEDS HBLn

PA23SS04	0.25
Total Carb PAHs	0.297
Benzo(a)anthracene	0.056 A/J
Chrysene	0.093 A/J
Benzo(b)fluoranthene	0.11 A/J
Benzo(a)pyrene	0.038 A/J
Total Noncarb PAHs	0.237
4,4'-DDE	0.20 J3
4,4'-DDD	0.58 J3
4,4'-DDT	2.8 J3
α-Chlordane	0.046 J3/J
α-Chlordane	0.014 J3/J
Aroclor-1260	0.56 J3/P
TOG	670 A
As	22.8 A/S
Cu	201 J2/*
Pb	1080 J2/*
Zn	2790 A/*
pH	7.6 A

PA23SS05	0.25
Total Carb PAHs	0.181
Chrysene	0.081 J0/J
Benzo(a)pyrene	0.10 A/J
Total Noncarb PAHs	0.060
TPH-Extr unk	130 A
TOG	3700 A
Pb	48.9 J2/*
Cu	143 J2/*
Zn	183 A/*
pH	7.2 A

PA23SS07	0.75
4,4'-DDD	0.00018 A/J
TPH-Mtr Oil	9.9 A/J
Cu	157 A

PA23SS06	0.25
Total Carb PAHs	1.113
Benzo(a)anthracene	0.40 A
Benzo(b)fluoranthene	0.39 A
Benzo(k)fluoranthene	0.14 A/J
Benzo(a)pyrene	0.13 A/J
Indeno(1,2,3-cd)pyrene	0.053 A/J
Total Noncarb PAHs	1.536
Dibenzofuran	0.038 A/J
Carbazole	0.097 A/J
4,4'-DDE	0.0059 J3
4,4'-DDT	0.011 J3/P
Aroclor-1260	0.067 J3/P
TPH-Extr unk	25 A
TOG	870 A
Be	3.2 A
Pb	64 J2/*
V	1960 A
Zn	132 A/*
pH	7.2 A



**EXPLANATION:**

SI SAMPLING LOCATIONS

▲ PA23SS07 SURFACE SOIL SAMPLE

PROPOSED RI SAMPLING LOCATIONS

■ B012 PROPOSED SOIL BORING/HYDROPUNCH

■ EE10 PROPOSED EXPLORATORY EXCAVATION

159 EXISTING BUILDING

EXISTING IR SITE

EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION

IR SITE BOUNDARY

PA SITE BOUNDARY

PARCEL BOUNDARY

RAILROAD TRACKS

FENCE

○ UST3(S-136) UNDERGROUND STORAGE TANK IN HPA TANK PROGRAM



HPAN0595 100.0  
19940413 1203



**Harding Lawson Associates**  
Engineering and  
Environmental Services

**Proposed Work Plan, PA-23, Bldgs 146,161,162, USTs 2 and 3**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

DRAWN DEK JOB NUMBER 11400 090502

APPROVED WWA

DATE 12/93

REVISED DATE



PA24MW01A	2.25	4.25	6.75	9.25	11.75	16.75
Acetone						
Carbon disulfide			0.0040 A/BJ			0.011 A/BJ
MIBK	0.0080 A/BJ					
Xylenes				0.0030 A/J	23 A	
TPH-Extr unk	52 A			270 A		
Pb	40 A			22.1 A/S		
pH	7.7 A	8.3 A	8.0 A	6.4 A	8.7 A	8.1 A
ChrysotileAsbestos			2.0 A			

PA24B002	2.25	4.25	6.75	9.25
Toluene			0.04831 A	
Ethyl benzene			0.01373 A	
Xylenes			0.07087 A	
Aroclor-1260			0.13 J3	
TPH-Diesel	58 J3	39 A	140 A	32 A
TOG	320 A	72 A	21000 A	85 A
pH	8.4 A	8.8 A	8.8 A	8.6 A
ChrysotileAsbestos	2.0 A	2.0 A		3.0 A

PA24B004	2.25	4.25	6.75	9.25	11.75
Carbon disulfide	0.00561 VJ7/J	0.00653 J7/J			
MIBK					
Xylenes	0.0055 V/J				
Total Noncarc PAHs	0.54692				
Aroclor-1260	1.4 V/S				
TPH-Diesel	925 V	28 A	24 A	28 A	4800 A
TPH-Gasoline		160 A	180 A	80 A	920 A
TOG	27000 V				7500 A
Na					5777 A
pH	8.3 V	8.2 A	8.2 A	8.3 A	9.5 A
ChrysotileAsbestos		2.0 A	2.0 A	2.0 A	2.0 A

PA24B003	1.75	3.75	6.75	9.25	11.75	16.75	21.75
Benzene							
TPH-Diesel	130 A	62 A	320 A	59 A	150 A	130 A	150 V
TOG	129.87 J3/N		148.05 J3/N				0.00736 V/J
Cu	4571.27 J3		7317.38 J3				
Mn			138.34 A				
V			191.74 A				
Zn							
pH	8.4 A	8.9 A	8.4 A	8.8 A	9.4 A	9.5 A	9.8 V
ChrysotileAsbestos			8.4 A	5.0 A	3.0 A	5.0 A	

PA24MW02A	2.25	4.25	6.75	9.25	11.75
Carbon disulfide	0.0020 A/J			0.0020 A/J	
Xylenes	0.40				
Total Noncarc PAHs	250 A				
TPH-Extr unk		110 A	1100 A	330 V	
TPH-Purg unk				1.4 V/d	
TOG	32000 A			230 V	
Pb	22.6 J2/*				
pH	8.1 J5	7.8 J5	7.7 J5	7.7 J5	8.1 V/S
ChrysotileAsbestos					

PA24B008	2.25	4.25	6.75
TPH-Diesel	51 A		
Pb	16.1 J2/*		
pH	8.3 J5	8.5 J5	8.3 J5
ChrysotileAsbestos	2.0 A	2.0 A	2.0 A

PA24B005	2.75	4.75	6.75	9.25
Carbon disulfide		0.01038 J7/J	0.00865 J7/J	
Xylenes		0.0036 A/J	0.00808 A/J	
Total Noncarc PAHs				0.12902
Phenol				0.18736 A/J
Aroclor-1260				0.045 J3/J
TPH-Diesel	12000 A	25 A	56 A	130 A
TOG	164.84 A/S	94 A	3800 A	98000 A
Pb				
Sb				
V				
pH	8.7 A	111.27 A	112.88 A	9.0 A

PA24B006	2.25	4.25
MIBK		0.05818 J7
2-Hexanone		0.0358 J7
Toluene		0.00546 A/J
Ethyl benzene		0.00367 A/J
Xylenes		0.01616 A
TPH-Diesel	74 A	1100 A
TOG	31000 A	58000 A
Pb	36.62 J3/N	
Cu	115.38 A	
pH	8.1 A	8.6 A
ChrysotileAsbestos		2.0 A

PA24B007	2.25	4.25	6.75	9.25	11.75
Total Carc PAHs		0.29101			
Chrysene		0.29101 A/J			
Total Noncarc PAHs	0.33238	0.33276			
TPH-Diesel	180 A	3100 A	680 A	180 A	150 A
TOG	2700 A	19000 A	110000 A	6500 A	266641 A
Mg					8.0 A
pH	8.9 A	8.9 A	9.0 A	8.9 A	
ChrysotileAsbestos			2.0 A		

PA24B010	2.75	5.25	8.25
Carbon Tet			
TCE	6.29231 A	0.0119 A/J	0.03939 J5
TPH-Diesel	28 A	52 A	
TPH-Gasoline	17 A		
TOG	720 A	1200 A	540 A
pH	9.1 A	8.6 A	8.6 A
ChrysotileAsbestos	2.0 A		

PA24MW03A	2.25	4.25	6.25	8.25	11.75	16.75
Carbon disulfide			0.0020 A/BJ		0.0070 A/J	0.0080 A/J
Total Carc PAHs						
Chrysene	7.8 A					
Phenol	3.5 A/BJ					
TPH-Diesel	58 A	18 A	76 A	290 V	8100 A	7500 A
TPH-Extr unk					240 A	200 A
TPH-Purg unk						2500 J25
TOG	41.8 A/S	20 A/S				
Pb		537 J3/N				
Cu		3550 J3/N				
Mn		7.7 A				
pH	7.4 A		8.8 A	8.2 A	8.5 A	8.3 A

## EXPLANATION:

### SI SAMPLING LOCATIONS

- PA24MW03A A-AQUIFER MONITORING WELL
- PA24B010 SOIL BORING

### RI SAMPLING LOCATIONS

- IR10MW14A A-AQUIFER MONITORING WELL
- IR10B030 SOIL BORING

### PRE-RI SAMPLING LOCATIONS

- BB2-9 EMCON SOIL BORING

- 159 EXISTING BUILDING
- EXISTING IR SITE
- EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- 155 LOCATION OF FORMER BUILDING
- IR SITE BOUNDARY
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS
- FENCE

PA24B009	2.75	5.75
TOG	120 A	130 A
pH	8.0 A	8.5 A
ChrysotileAsbestos		2.0 A

PROJECT AND LABORATORY QUALIFIERS;  
QUALIFIERS ARE DEFINED IN  
TABLES F-48 AND F-49

CONCENTRATIONS IN MILLIGRAMS  
PER KILOGRAM UNLESS OTHERWISE NOTED

ANALYTE - INCLUDES ALL DETECTED ORGANICS  
AND ALL INORGANICS EXCEEDING INTERIM  
AMBIENT LEVELS (IALs) FOR HPA

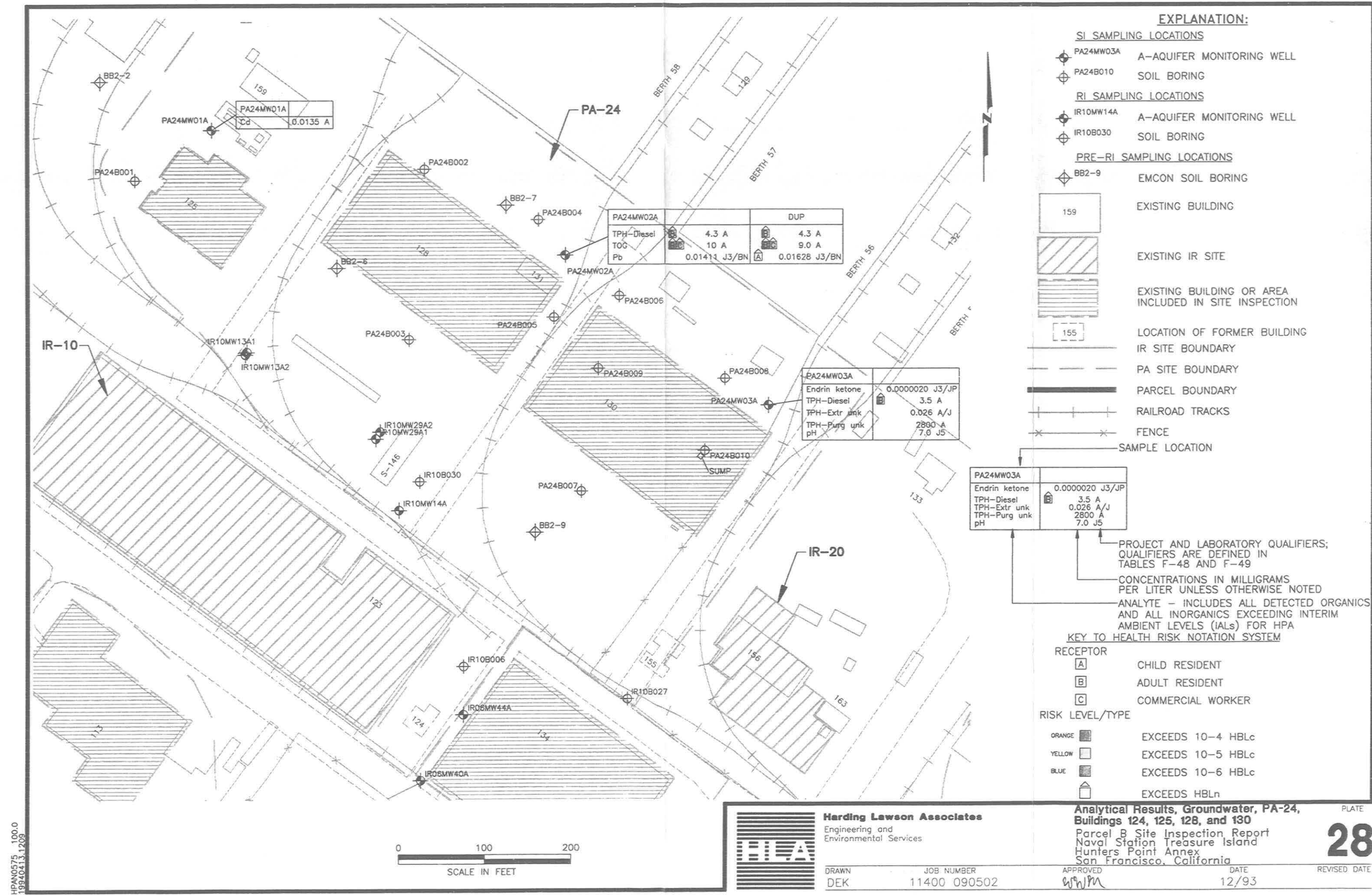
### KEY TO HEALTH RISK NOTATION SYSTEM

#### RECEPTOR

- A CHILD RESIDENT
- B ADULT RESIDENT
- C COMMERCIAL WORKER

#### RISK LEVEL/TYPE

- ORANGE EXCEEDS 10-4 HBLc
- YELLOW EXCEEDS 10-5 HBLc
- BLUE EXCEEDS 10-6 HBLc
- EXCEEDS HBLn



**EXPLANATION:**

**SI SAMPLING LOCATIONS**

- PA24MW03A A-AQUIFER MONITORING WELL
- PA24B010 SOIL BORING

**RI SAMPLING LOCATIONS**

- IR10MW14A A-AQUIFER MONITORING WELL
- IR10B030 SOIL BORING

**PRE-RI SAMPLING LOCATIONS**

- BB2-9 EMCON SOIL BORING

- 159 EXISTING BUILDING
- EXISTING IR SITE
- EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- 155 LOCATION OF FORMER BUILDING
- IR SITE BOUNDARY
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS
- FENCE
- SAMPLE LOCATION

PA24MW02A		DUP
TPH-Diesel	4.3 A	4.3 A
TOG	10 A	9.0 A
Pb	0.01411 J3/BN	0.01628 J3/BN

PA24MW03A	
Endrin ketone	0.0000020 J3/JP
TPH-Diesel	3.5 A
TPH-Extr unk	0.026 A/J
TPH-Purg unk	2800 A
pH	7.0 J5

PA24MW03A	
Endrin ketone	0.0000020 J3/JP
TPH-Diesel	3.5 A
TPH-Extr unk	0.026 A/J
TPH-Purg unk	2800 A
pH	7.0 J5

PROJECT AND LABORATORY QUALIFIERS;  
QUALIFIERS ARE DEFINED IN  
TABLES F-48 AND F-49

CONCENTRATIONS IN MILLIGRAMS  
PER LITER UNLESS OTHERWISE NOTED  
ANALYTE - INCLUDES ALL DETECTED ORGANICS  
AND ALL INORGANICS EXCEEDING INTERIM  
AMBIENT LEVELS (IALs) FOR HPA

**KEY TO HEALTH RISK NOTATION SYSTEM**

- RECEPTOR
- A CHILD RESIDENT
  - B ADULT RESIDENT
  - C COMMERCIAL WORKER

- RISK LEVEL/TYPE
- ORANGE EXCEEDS 10-4 HBLc
  - YELLOW EXCEEDS 10-5 HBLc
  - BLUE EXCEEDS 10-6 HBLc
  - EXISTING HBLn



**Harding Lawson Associates**  
Engineering and  
Environmental Services

**Analytical Results, Groundwater, PA-24,**  
**Buildings 124, 125, 128, and 130**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

DRAWN DEK  
JOB NUMBER 11400 090502

APPROVED *WPM*  
DATE 12/93

0 100 200  
SCALE IN FEET





# EXPLANATION:

## SI SAMPLING LOCATIONS

- PA24MW03A A-AQUIFER MONITORING WELL
- PA24B010 SOIL BORING

## PROPOSED RI SAMPLING LOCATIONS

- MW04A PROPOSED A-AQUIFER MONITORING WELL
- B012 PROPOSED BORING

- 159 EXISTING BUILDING
- EXISTING IR SITE
- EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- 155 LOCATION OF FORMER BUILDING

- IR SITE BOUNDARY
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS
- FENCE

0 100 200  
SCALE IN FEET



**Harding Lawson Associates**  
Engineering and  
Environmental Services

**Proposed Work Plan, PA-24, Buildings 124, 125, 128, and 130** PLATE  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

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DRAWN DEK  
JOB NUMBER 11400 090502

APPROVED WWM

DATE 12/93

REVISED DATE

## EXPLANATION:

## SI SAMPLING LOCATIONS

- PA25B009 SOIL BORING
- PA25SS10 SURFACE SOIL SAMPLE
- PA25SU01 SUMP SAMPLE
- 134 EXISTING BUILDING
- EXISTING IR SITE
- EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- 155 LOCATION OF FORMER BUILDING
- IR SITE BOUNDARY
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS
- FENCE

## SAMPLE LOCATION

SAMPLE DEPTH IN FEET  
BELOW GROUND SURFACE OR MATRIX

PA25B009	4.75
PCE	0.0040 A/J
Total Carb PAHs	0.36
Chrysene	0.36 A/J
TPH-Extr unk	65 A
TOG	3300 J5/B
pH	8.6 A

PROJECT AND LABORATORY QUALIFIERS;  
QUALIFIERS ARE DEFINED IN  
TABLES F-48 AND F-49

CONCENTRATIONS IN MILLIGRAMS  
PER KILOGRAM OR MILLIGRAMS PER  
LITER UNLESS OTHERWISE NOTED

ANALYTE - INCLUDES ALL DETECTED ORGANICS  
AND ALL INORGANICS EXCEEDING INTERIM  
AMBIENT LEVELS (IALs) FOR HPA

## KEY TO HEALTH RISK NOTATION SYSTEM

## RECEPTOR

- [A] CHILD RESIDENT
- [B] ADULT RESIDENT
- [C] COMMERCIAL WORKER

## RISK LEVEL/TYPE

- ORANGE EXCEEDS 10-4 HBLc
- YELLOW EXCEEDS 10-5 HBLc
- BLUE EXCEEDS 10-6 HBLc
- EXCEEDS HBLn

PA25SU01	PRODUCT	WATER
Vinyl chloride		0.0050 A/J
Methylene Chloride		3.5 A/B
Chloroform		0.0020 A/J
1,2-DCA		0.0020 A/J
TCE		0.026 A
Benzene		0.0010 A/J
MIBK		0.0070 A/J
PCE		0.0020 A/J
Toluene		0.0070 A/J
1,1,2,2-PCA		0.0010 A/J
Chlorobenzene		0.0020 A/J
Ethyl benzene		0.0010 A/J
Xylenes		0.0070 A/J
Phenol		17 A
2-Methylphenol		3.3 A
4-Methylphenol		5.7 A
2,4-Dimethylphenol		0.56 A/J
Methylene Chloride	95000 A/JB	
Aroclor-1260	800000 A	0.14 A
TPH-Extr unk	200000 A	15 A/d
TPH-Purg unk	790 A/1	0.62 A/d
TOG	790000 A/R	
Pb	129 A/S	0.0019 A/B
Bo	3.6 A/B	0.0558 A/B
Cd	3.7 A	
Co	83 A/B	53 A
Cr	118 A	0.482 A
Cu	98.3 A	
Fe	230 A	1.05 A
Mg		3.85 A/B
Mn	1.0 A/B	0.135 A
Ni		0.0177 A/B
K		76.5 A
Na		41.3 A
V		0.0030 A/B
Zn		
Mo	147 A	0.0049 A/B

PA25SU06	VAT LIQUID	SUMP SLUDGE
Pentachlorophenol		50292.02 A
Aroclor-1260		7100 J3/P
TPH-Diesel	0.55 A/J	900 A
TPH-Gasoline	2.3 A	
TOG	14000 A	7800 A
Hg		2.09 J3
As		11.77 J3/N+
Al		19391.9 A
Bo	0.12 A/B	5491.07 A
Cd		379.48 A
Co		15723.9 A
Cr		1063.33 A
Co		55.56 A
Cu		2196.94 A
Fe		17522.1 A
Mg		4684.73 A/B
Mn		845.09 A
Ni	1.37 A/B	828.14 A
K	30.54 A/B	1255.46 A/B
Ag		28.87 A
Na	62.34 A/B	9652.84 A
V		44.44 A/B
Zn		71334.3 A
Mo		68.07 A
Cr VI		5500 J2
pH		7.0 A

PA25B002	11.25	16.25
1,2-DCE (total)		0.06775 V
1,2-DCA		0.05407 V
TCE		0.02653 V
PCE	0.00927 A/J	0.1256 V
Chlorobenzene		0.00635 V
TPH-Diesel	540 A	230 V
TOG	26000 A	35000 V
Pb	15.63 J3/N	
pH	8.1 A	7.6 A

PA25B009	4.75
PCE	0.0040 A/J
Total Carb PAHs	0.36
Chrysene	0.36 A/J
TPH-Extr unk	65 A
TOG	3300 J5/B
pH	8.6 A

PA25SS10	1.25
Total Carb PAHs	1.43
Benzo(a)anthracene	0.42 A
Chrysene	0.40 A
Benzo(b)fluoranthene	0.27 A/J
Benzo(k)fluoranthene	0.34 A/J
Total Noncarb PAHs	1.14
4,4'-DDD	0.0018 A/J
a-Chlordane	0.000098 A/J
TPH-Mtr Oil	24 A
TOG	110 A

PA25SS04	0.75
Aroclor-1260	ABC 3.8 A
TPH-Extr unk	3400 A
TOG	6000 A
Cu	485 J2/
Pb	1230 J2/
Zn	1770 A/
pH	7.4 J5

0 50 100  
SCALE IN FEET



**Harding Lawson Associates**  
Engineering and  
Environmental Services

DRAWN DEK  
JOB NUMBER 11400 090502

**Analytical Results, PA-25, Building 134**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

APPROVED WWM  
DATE 12/93

REVISED DATE

PLATE

30



# EXPLANATION:

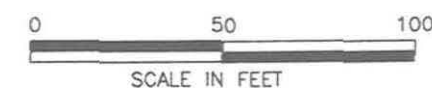
## SI SAMPLING LOCATIONS

- PA25B009 SOIL BORING
- PA25SS10 SURFACE SOIL SAMPLE
- PA25SU01 SUMP SAMPLE

## PROPOSED RI SAMPLING LOCATIONS

- B014 PROPOSED SOIL BORING
- 134 EXISTING BUILDING
- EXISTING IR SITE
- EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- 155 LOCATION OF FORMER BUILDING

- IR SITE BOUNDARY
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS
- FENCE



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**Harding Lawson Associates**  
Engineering and  
Environmental Services

DRAWN DEK  
JOB NUMBER 11400 090502

**Proposed Work Plan, PA-25, Building 134**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

APPROVED WWM  
DATE 12/93

PLATE  
**31**  
REVISED DATE



## EXPLANATION:

## SI SAMPLING LOCATIONS

- PA26SS07 SURFACE SOIL SAMPLE
- PA26SB06 SAND BLAST MATERIAL
- PA26SU09 SUMP SAMPLE
- PA26SW03 STORM DRAIN SEDIMENT SAMPLE
- PA26AS08 ASBESTOS SAMPLE
- 207 EXISTING BUILDING
- EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- FACILITY BOUNDARY
- RAILROAD TRACKS
- FENCE

SAMPLE LOCATION

SAMPLE DEPTH IN FEET BELOW GROUND SURFACE

PROJECT AND LABORATORY QUALIFIERS;  
QUALIFIERS ARE DEFINED IN TABLES F-48 AND F-49

CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM  
UNLESS OTHERWISE NOTED

ANALYTE - INCLUDES ALL DETECTED ORGANICS AND  
ALL INORGANICS EXCEEDING INTERIM  
AMBIENT LEVELS (IALs) FOR HPA

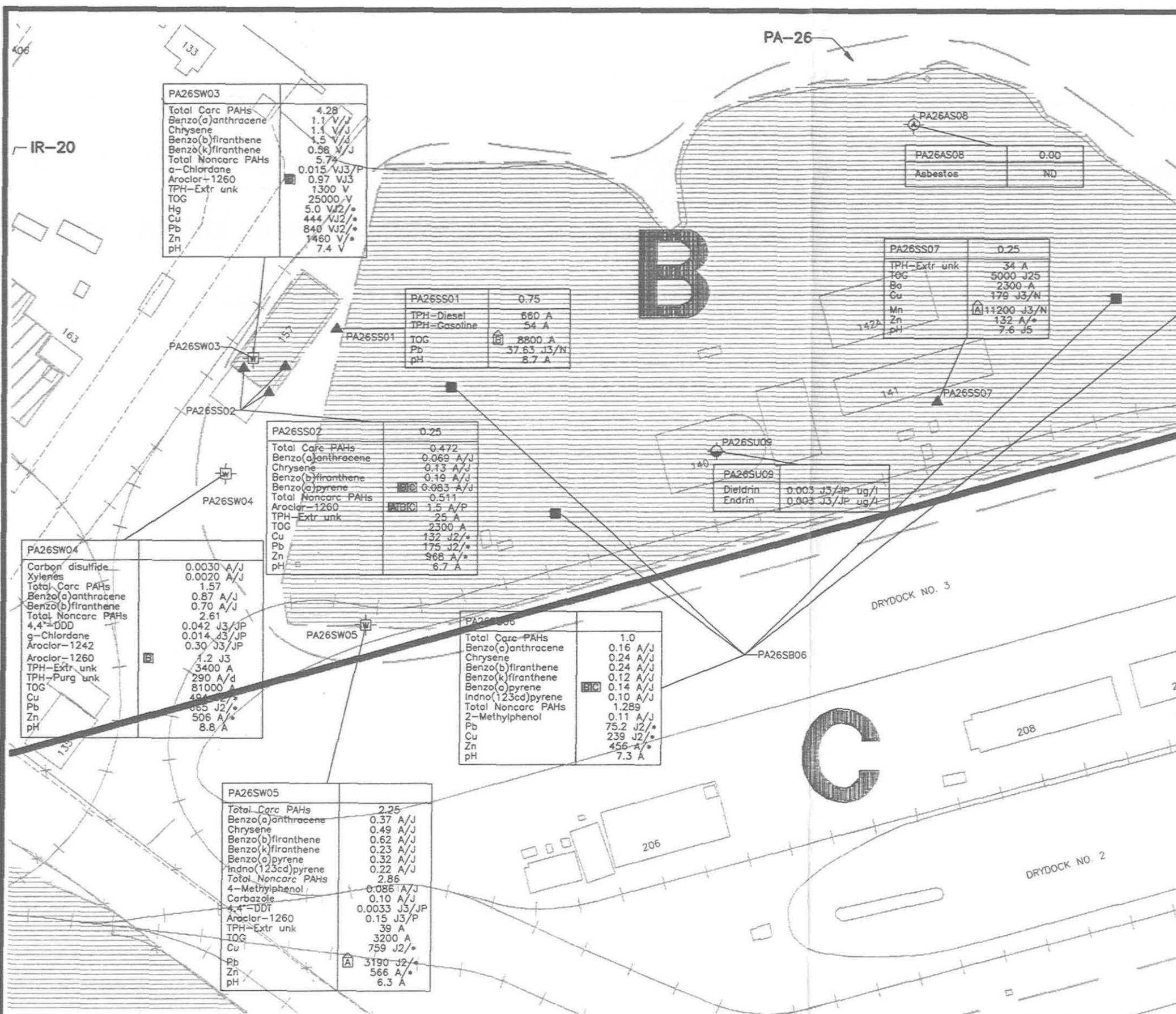
## KEY TO HEALTH RISK NOTATION SYSTEM

## RECEPTOR

- [A] CHILD RESIDENT
- [B] ADULT RESIDENT
- [C] COMMERCIAL WORKER

## RISK LEVEL/TYPE

- ORANGE EXCEEDS 10-4 HBLc
- YELLOW EXCEEDS 10-5 HBLc
- BLUE EXCEEDS 10-6 HBLc
- EXISTING BUILDING EXCEEDS HBLn



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SCALE IN FEET



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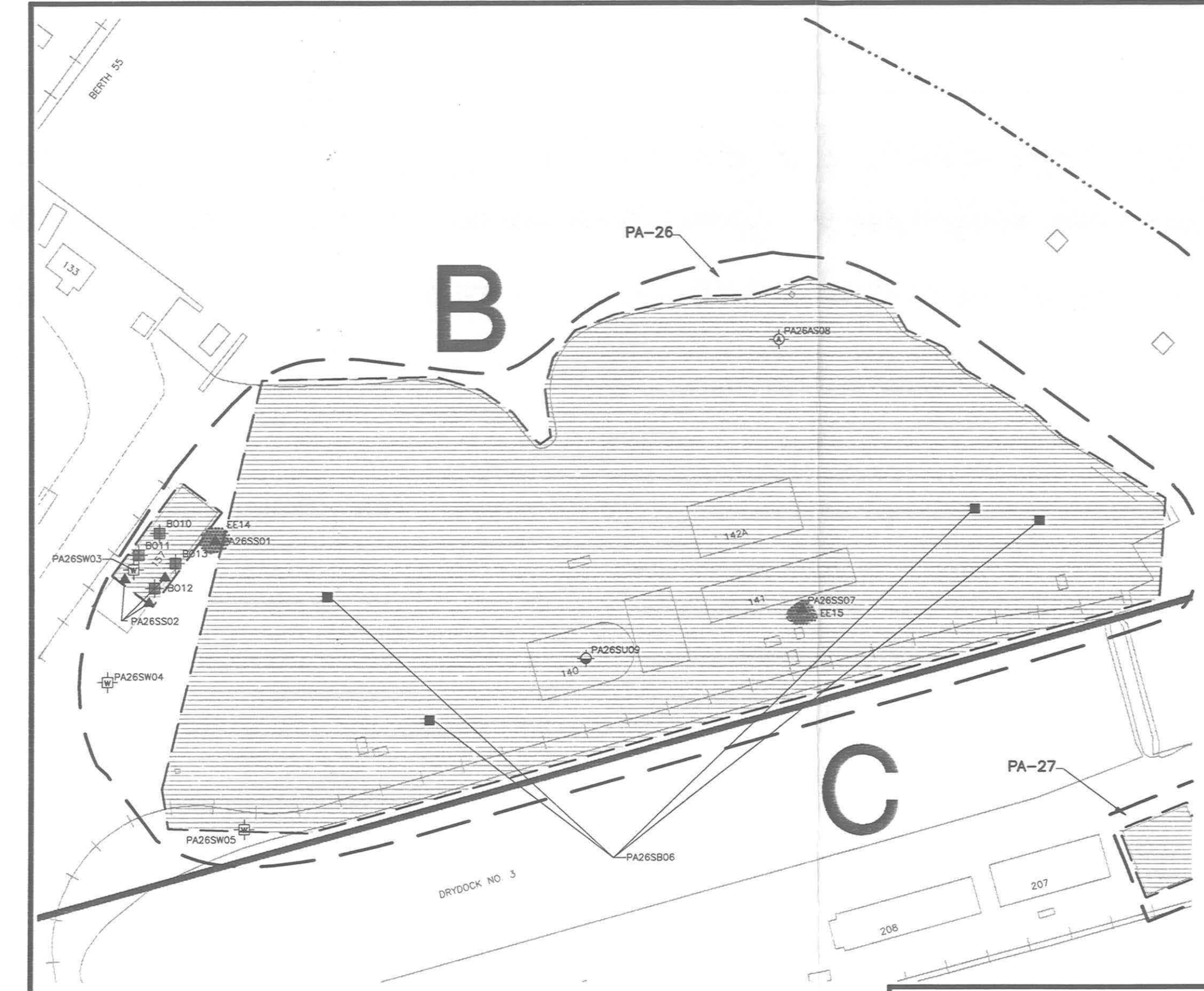
**Analytical Results, PA-26, Building 157 and Area XIV**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

APPROVED WWM  
DATE 12/93

REVISED DATE

32





**EXPLANATION:**

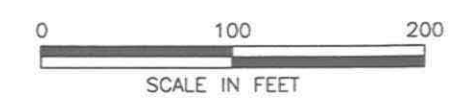
SI SAMPLING LOCATIONS

- PA26SS07 SURFACE SOIL SAMPLE
- PA26SB06 SAND BLAST MATERIAL
- PA26SU09 SUMP SAMPLE
- PA26SW03 STORM DRAIN SEDIMENT SAMPLE
- PA26AS08 ASBESTOS SAMPLE

PROPOSED RI SAMPLING LOCATIONS

- B013 PROPOSED SOIL BORING
- EE15 PROPOSED EXPLORATORY EXCAVATION
- 207 EXISTING BUILDING
- EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION

- PA SITE BOUNDARY
- PARCEL BOUNDARY
- FACILITY BOUNDARY
- RAILROAD TRACKS
- FENCE



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**Proposed Work Plan, PA-26, Building 157 and Area XIV** PLATE  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

**33**

DRAWN DEK	JOB NUMBER 11400 090502	APPROVED <i>WWM</i>	DATE 12/93	REVISED DATE
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# EXPLANATION:

## SI SAMPLING LOCATIONS

- PA31SB01 SAND BLAST MATERIAL
- 115 EXISTING BUILDING
- 114 EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- 114 LOCATION OF FORMER BUILDING
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS
- FENCE

SAMPLE LOCATION  
SAMPLE DEPTH IN FEET  
BELOW GROUND SURFACE

PA31SB01	0.00
Total Noncarc PAHs	0.084
Mo	10.4 A/*
pH	7.5 J5

PROJECT AND LABORATORY QUALIFIERS;  
QUALIFIERS ARE DEFINED IN TABLES F-48 AND F-49  
CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM  
UNLESS OTHERWISE NOTED  
ANALYTE - INCLUDES ALL DETECTED ORGANICS AND  
ALL INORGANICS EXCEEDING INTERIM  
AMBIENT LEVELS (IALs) FOR HPA

## KEY TO HEALTH RISK NOTATION SYSTEM

- RECEPTOR
- A CHILD RESIDENT
  - B ADULT RESIDENT
  - C COMMERCIAL WORKER

- RISK LEVEL/TYPE
- ORANGE EXCEEDS 10-4 HBLc
  - YELLOW EXCEEDS 10-5 HBLc
  - BLUE EXCEEDS 10-6 HBLc
  - EXCEEDS HBLn

0 50 100  
SCALE IN FEET



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**Analytical Results, PA-31, Building 114**  
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Hunters Point Annex  
San Francisco, California

PLATE

**34**

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JOB NUMBER 11400 090502

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DATE  
12/93

REVISED DATE

# EXPLANATION:

## SI SAMPLING LOCATIONS

- PA42B004 SOIL BORING
- PA42SS06 SURFACE SOIL SAMPLE

- 120 EXISTING BUILDING
- EXISTING IR SITE
- EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- IR SITE BOUNDARY
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS
- FENCE

SAMPLE LOCATION  
SAMPLE DEPTH IN FEET BELOW GROUND SURFACE

PA42B001	5.75	10.75
TOG	91 A	80 A
pH	7.0 A	7.3 A

PROJECT AND LABORATORY QUALIFIERS;  
QUALIFIERS ARE DEFINED IN TABLES F-48 AND F-49  
CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM  
UNLESS OTHERWISE NOTED  
ANALYTE - INCLUDES ALL DETECTED ORGANICS AND  
ALL INORGANICS EXCEEDING INTERIM  
AMBIENT LEVELS (IALs) FOR HPA

## KEY TO HEALTH RISK NOTATION SYSTEM

- RECEPTOR
- A CHILD RESIDENT
  - B ADULT RESIDENT
  - C COMMERCIAL WORKER
- RISK LEVEL/TYPE
- ORANGE EXCEEDS 10-4 HBLc
  - YELLOW EXCEEDS 10-5 HBLc
  - BLUE EXCEEDS 10-6 HBLc
  - EXCEEDS HBLn

PA42SS06	1.25
Total Noncarc PAHs	0.026
4,4'-DDE	0.00024 A/J
4,4'-DDD	0.00035 A/J
Endosulfan sulfate	0.00029 A/J
γ-Chlordane	0.00024 A/J
TPH-Mtr Oil	34 A
TOG	46 A

PA42B004	1.75	6.25	11.25
Total Carc PAHs		0.043	
Benzo(b)fluoranthene		0.043 A/J	
Total Noncarc PAHs	0.047	0.165	
Dibenzofuran	0.064 A/J		
Aroclor-1254		0.064 J3	
Aroclor-1260		0.057 J3	
TPH-Extr unk	15 A/d	22 A/d	
TOG	91 A	95 A	
pH	7.8 A	7.5 A	7.2 A

PA42B001	5.75	10.75
TOG	91 A	80 A
pH	7.0 A	7.3 A

0 50 100  
SCALE IN FEET



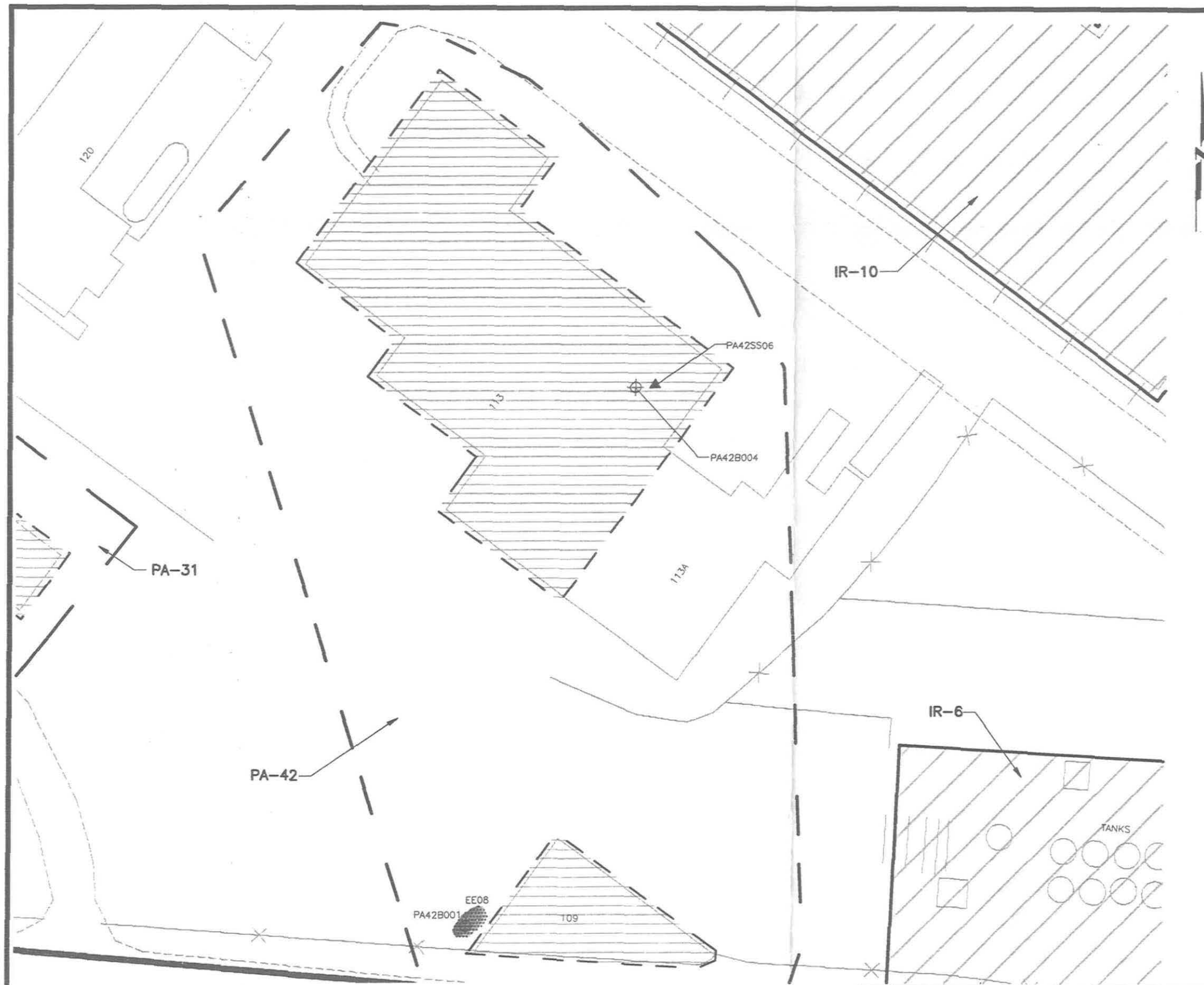
**Harding Lawson Associates**  
Engineering and  
Environmental Services

DRAWN DEK  
JOB NUMBER 11400 090502

**Analytical Results, PA-42, Buildings 109 and 113**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

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DATE 12/93

PLATE  
**35**  
REVISED DATE



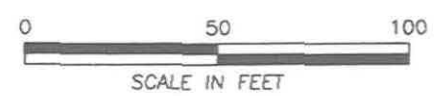
**EXPLANATION:**

SI SAMPLING LOCATIONS

- ⊕ PA42B004 SOIL BORING
- ▲ PA42SS06 SURFACE SOIL SAMPLE

PROPOSED RI SAMPLING LOCATION

- EE08  
[Hatched Oval] PROPOSED EXPLORATORY EXCAVATION
- [Box with 120] EXISTING BUILDING
- [Hatched Box] EXISTING IR SITE
- [Dashed Box] EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- [Solid Line] IR SITE BOUNDARY
- [Dashed Line] PA SITE BOUNDARY
- [Thick Solid Line] PARCEL BOUNDARY
- [Line with Cross-Ticks] RAILROAD TRACKS
- [Line with X-Ticks] FENCE



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**Harding Lawson Associates**

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Environmental Services

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11400 090502

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[Signature]

**Proposed Work Plan, PA-42, Buildings 109 and 113** PLATE

Parcel B Site Inspection Report

Naval Station Treasure Island

Hunters Point Annex

San Francisco, California

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REVISD DATE

DATE  
12/93



## EXPLANATION:

## SI SAMPLING LOCATIONS

- PA57SB13 SAND BLAST MATERIAL  
 □ PA57SW12 STORM DRAIN SEDIMENT SAMPLE  
 ▲ PA57SS15 SURFACE SOIL SAMPLE

- 301 EXISTING BUILDING  
 EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION  
 PA SITE BOUNDARY  
 PARCEL BOUNDARY  
 RAILROAD TRACKS  
 FENCE

SAMPLE LOCATION  
 SAMPLE DEPTH IN FEET BELOW GROUND SURFACE

PA57SS15	0.75
Ethyl benzene	0.08611 A
Xylenes	0.5664 A
TPH-Diesel	210 A
TPH-Gasoline	120 A
TOC	14000 A
Pb	45.56 J2/A
Zn	179.08 A
pH	9.6 A

PROJECT AND LABORATORY QUALIFIERS; QUALIFIERS ARE DEFINED IN TABLES F-48 AND F-49

CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM UNLESS OTHERWISE NOTED

ANALYTE - INCLUDES ALL DETECTED ORGANICS AND ALL INORGANICS EXCEEDING INTERIM AMBIENT LEVELS (IALs) FOR HPA

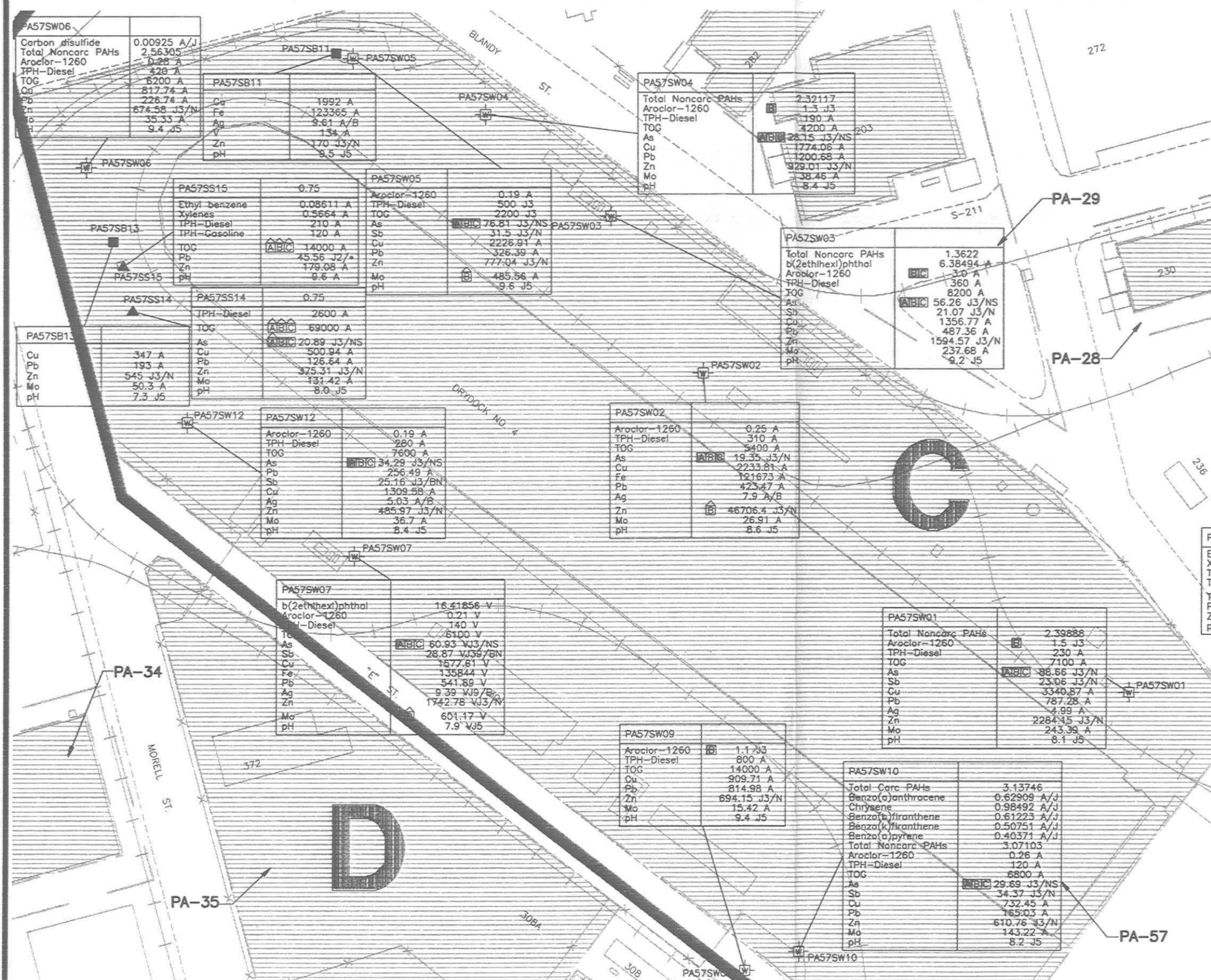
## KEY TO HEALTH RISK NOTATION SYSTEM

## RECEPTOR

- [A] CHILD RESIDENT  
 [B] ADULT RESIDENT  
 [C] COMMERCIAL WORKER

## RISK LEVEL/TYPE

- ORANGE EXCEEDS 10-4 HBLc  
 YELLOW EXCEEDS 10-5 HBLc  
 BLUE EXCEEDS 10-6 HBLc  
 EXCEEDS HBLn



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 Engineering and  
 Environmental Services

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 DEK

JOB NUMBER  
 11400 090502

APPROVED  
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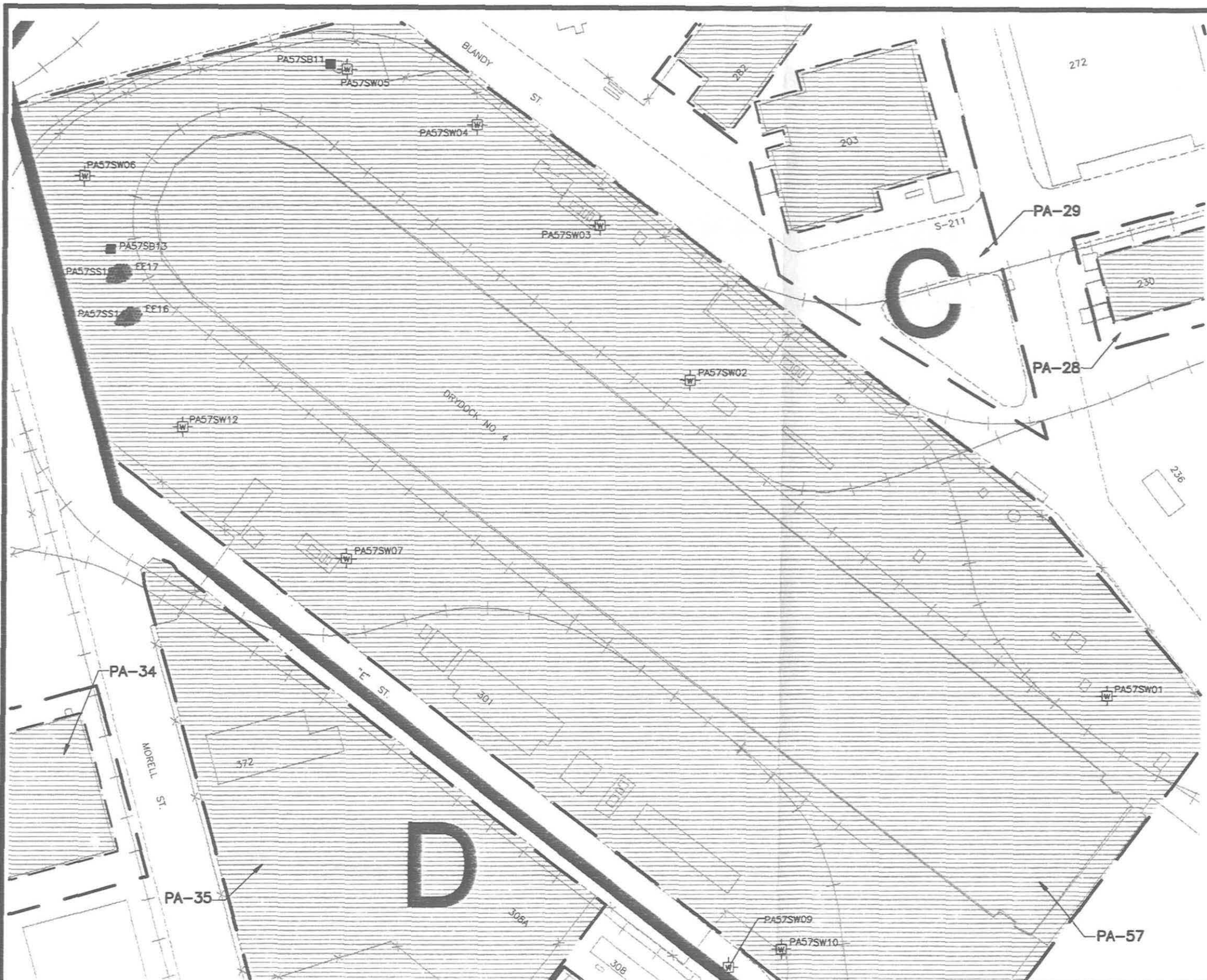
DATE  
 12/93

REVISED DATE

**Analytical Results, PA-57, Drydock 4 Area**  
 Parcel B Site Inspection Report  
 Naval Station Treasure Island  
 Hunters Point Annex  
 San Francisco, California

PLATE

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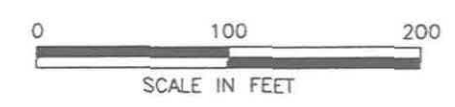
**EXPLANATION:**

SI SAMPLING LOCATIONS

- PA57SB13 SAND BLAST MATERIAL
- ⊕ PA57SW12 STORM DRAIN SEDIMENT SAMPLE
- ▲ PA57SS15 SURFACE SOIL SAMPLE

PROPOSED RI SAMPLING LOCATION

- EE17 PROPOSED EXPLORATORY EXCAVATION
- 301 EXISTING BUILDING
- ▨ EXISTING BUILDING OR AREA INCLUDED IN SITE INSPECTION
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- + + + RAILROAD TRACKS
- × × × FENCE



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**Harding Lawson Associates**  
Engineering and  
Environmental Services

DRAWN DEK JOB NUMBER 11400 090502

**Proposed Work Plan, PA-57, Drydock 4 Area**  
Parcel B Site Inspection Report  
Naval Station Treasure Island  
Hunters Point Annex  
San Francisco, California

APPROVED *WWM* DATE 12/93 REVISED DATE



# EXPLANATION:

## RI AND SI SAMPLING LOCATIONS

- PA240000 SOIL BORING
- PA240000A A-AQUIFER MONITORING WELL
- PA240000B BEDROCK MONITORING WELL
- PA240000C PIEZOMETER
- PA240000D SURFACE SOIL SAMPLE
- PA240000E SAND BLAST MATERIAL
- PA240000F TEST PIT. SYMBOL DOES NOT REPRESENT TRUE LENGTH OF TEST PIT
- PA240000G STORM DRAIN SEDIMENT SAMPLE
- PA240000H CATCH BASIN
- PA240000I FLOOD CONTROL GATE
- PA240000J SANITARY SEWER
- PA240000K STEAMLINE INSPECTION
- PA240000L STEAMLINE INSPECTION AND BORESCOPE
- PA240000M SUMP SAMPLE
- PA240000N ASBESTOS
- PA240000O GROUND PENETRATING RADAR PROFILE
- PA240000P TIDAL STATION

## PRE-RI SAMPLING LOCATIONS

- PA240000A EMCON SOIL BORING
- PA240000B EMCON A-AQUIFER MONITORING WELL
- PA240000C EMCON BEDROCK MONITORING WELL

## PROPOSED RI SAMPLING LOCATIONS

- PA240000A PROPOSED A-AQUIFER MONITORING WELL
- PA240000B PROPOSED BEDROCK MONITORING WELL
- PA240000C PROPOSED SOIL BORING
- PA240000D PROPOSED SOIL BORING/HYDROPUNCH
- PA240000E PROPOSED SOIL BORING/HYDROPUNCH TRANSECT
- PA240000F PROPOSED TEST PIT
- PA240000G PROPOSED EXPLORATORY EXCAVATION

- EXISTING IR SITE
- BUILDING OR AREA IDENTIFIED FOR INVESTIGATION WITHIN A PA SITE
- LOCATION OF FORMER BUILDING
- UNDERGROUND STORAGE TANK IN HPA TANK PROGRAM
- PA SITE BOUNDARY
- PARCEL BOUNDARY
- RAILROAD TRACKS
- FENCE

150 0 150 300  
SCALE IN FEET

DRAWN: DMC ENGINEER: CHECKED: DATE:		PROJECT NO: 11400 090502 SCALE: 1" = 150' APPROVED: [Signature] DATE:		HARDING LAWSON ASSOCIATES Engineering and Environmental Services		DEPARTMENT OF THE NAVY WESTERN DIVISION San Bruno, California Parcel B Site Inspection Report Naval Station Treasure Island Hunters Point Annex San Francisco, California		SUMMARY OF PROPOSED WORK PLANS, PARCEL B		PLATE 39 SHEET: OF REVISION NUMBER: DATE: 4/94	
NO. DATE REVISIONS BY CHK											